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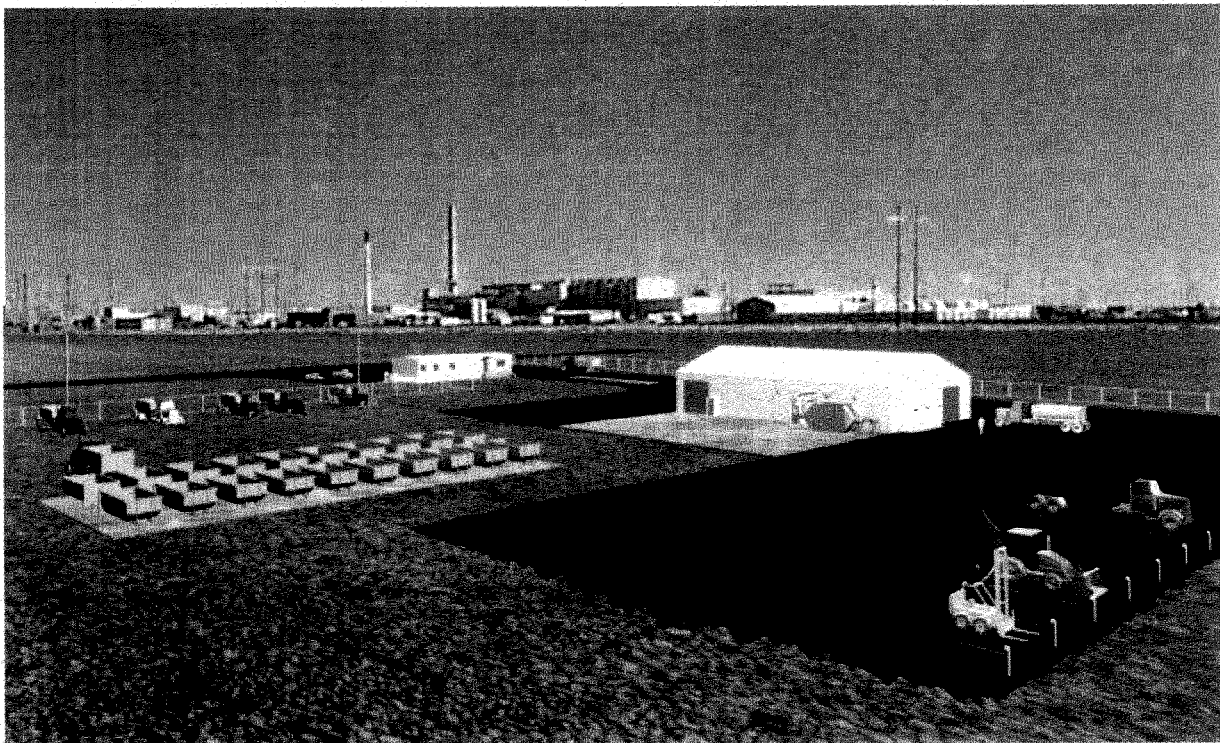
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Idaho Operations Office

Remedial Design/Construction Work Plan for the Waste Area Group 3 Staging, Storage, Sizing, and Treatment Facility



Idaho National Engineering and Environmental Laboratory

Remedial Design/Construction Work Plan for the Waste Area Group 3 Staging, Storage, Sizing, and Treatment Facility

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ABSTRACT

This Remedial Design/Construction Work Plan provides the remedial design and construction documents for constructing the Staging, Storage, Sizing, and Treatment Facility for the Operable Unit 3-13, Group 3 – Other Surface Soils, INEEL CERCLA Disposal Facility. The Staging, Storage, Sizing, and Treatment Facility is designed to provide centralized receiving, inspection, and treatment necessary to receive, stage, store, and treat incoming Comprehensive Environmental Response, Compensation, and Liability Act investigation-derived, remedial, and removal waste at the Idaho National Engineering and Environmental Laboratory prior to final disposition in the disposal facility or shipment off-Site. This work plan presents the design basis and criteria based upon an evaluation of the remedial action requirements set forth in the Operable Unit 3-13 *Final Record of Decision*. It presents the design and construction requirements of the different buildings and treatment processes that are part of the Staging, Storage, Sizing, and Treatment Facility. Summaries of the construction work elements are also provided herein. Additionally, a construction schedule through prefinal inspection and a cost estimate for the construction of the facilities are also presented.

Remedial design/construction documentation included with this plan are the technical and functional requirements, Engineering Design Files and documents describing the design basis, construction specifications and drawings, construction inspection plan, construction health and safety plan, construction waste management plan, and storm water pollution prevention plans.

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ACRONYMS

ACGIH	American Conference of Government Hygienists
ADA	Americans with Disabilities Act
ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
CAMU	Corrective Action Management Unit
CDR	Conceptual Design Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPP	Chemical Processing Plant
CWID	CERCLA Waste Inventory Database
D&D	decontamination and decommissioning
DD&D	deactivation, decontamination, and decommissioning
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
DOT	Department of Transportation
EAM	emergency action manager
ECA	Environmentally Controlled Area
EDF	Engineering Design File
EPA	Environmental Protection Agency
ER	Environmental Restoration
FFA/CO	Federal Facility Agreement and Consent Order
FMCSR	Federal Motor Carrier Safety Regulations
FS	feasibility study

GSA	General Services Administration
HASP	Health and Safety Plan
HDPE	high-density polyethylene
HEPA	high-efficiency particulate air
HVAC	heating, ventilating, and air conditioning
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
ID	identification
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
ITD	Idaho Transportation Department
IWTS	Integrated Waste Tracking System
LDR	land disposal restriction
MCP	management control procedure
MLLW	mixed low-level waste
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NPH	natural phenomena hazard
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
OU	operable unit
PCB	polychlorinated biphenyl
PCM	personnel contamination monitor
PDR	Preliminary Design Report

PPE	personal protective equipment
QA/QC	quality assurance/quality control
QPP	Quality Program Plan
RA	remedial action
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD/CWP	Remedial Design/Construction Work Plan
RD/RA	remedial design/remedial action
RFP	Request for Proposal
RI	remedial investigation
RI/BRA	remedial investigation/baseline risk assessment
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SMACNA	Sheet Metal and Air-Conditioning Contractor's National Association
SOW	scope of work
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SSC	structures, systems, and components
SSSTF	Staging, Storage, Sizing, and Treatment Facility
STD	standard
SWPPP-CA	Storm Water Pollution Prevention Plan for Construction Activities
TFR	technical and functional requirements
TCLP	toxicity characteristic leaching procedure
TPR	technical procedure
TSCA	Toxic Substances Control Act
TWA	time-weighted average

UBC	Uniform Building Code
UPC	Uniform Plumbing Code
VFD	variable-frequency drive
WAC	Waste Acceptance Criteria
WAG	waste area group
WBS	Work Breakdown Structure
WCC	Warning Communications Center

Remedial Design/Construction Work Plan for the Waste Area Group 3 Staging, Storage, Sizing, and Treatment Facility

1. INTRODUCTION

In accordance with the Idaho National Engineering and Environmental Laboratory (INEEL) *Federal Facility Agreement and Consent Order* (FFA/CO) (DOE-ID 1991), the Department of Energy Idaho Operations Office (DOE-ID) submits the following Remedial Design/Construction Work Plan (RD/CWP) for the Staging, Storage, Sizing, and Treatment Facility (SSSTF) within Operable Unit (OU) 3-13 in Waste Area Group (WAG) 3. The SSSTF is a support facility for the INEEL CERCLA Disposal Facility (ICDF). The SSSTF is designed to provide centralized receiving, inspection, and treatment necessary to receive, stage, store, and treat incoming waste from various INEEL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation sites prior to disposal in the ICDF or shipment off-Site.

The remedial design/construction activities identified in this Work Plan, as part of the CERCLA process, will proceed in accordance with the signed OU 3-13 *Final Record of Decision* (ROD) (DOE-ID 1999) and the *RD/RA Scope of Work* (SOW) (DOE-ID 2000a) for WAG 3, OU 3-13. This RD/CWP provides the framework for defining the remedial design and the design documentation, along with the implementation of construction of the SSSTF.

Following finalization of this RD/CWP, a remedial action work plan (RA) will be developed for both the SSSTF and ICDF. This ICDF Complex RA WP will provide the operational and management information of the ICDF Complex, including the SSSTF.

1.1 Background

The Idaho Nuclear Technology and Engineering Center (INTEC), formerly known as the Idaho Chemical Processing Plant (CPP), is located in the south-central area of the INEEL in southeastern Idaho (see Figure 1-1). From 1952 to 1992, operations at INTEC primarily involved reprocessing spent nuclear fuel from defense projects, which entailed extracting reusable uranium from the spent fuels. Liquid waste generated from the reprocessing activities, which ceased in 1992, is stored in an underground tank farm at INTEC. Both soil and groundwater contamination have resulted from these previous operations. Under the FFA/CO, the U.S. Environmental Protection Agency (EPA), Idaho Department of Environmental Quality (IDEQ), and U.S. Department of Energy (DOE) (collectively referred to as the Agencies) are directing cleanup activities to reduce human health and environmental risks to acceptable levels. Per the FFA/CO, INTEC is designated as WAG 3. In order to facilitate remediation of the INTEC, WAG 3 was further divided into OUs comprised of individual contaminant release sites.

Several phases of investigation have been performed at the OUs within WAG 3. A comprehensive remedial investigation/baseline risk assessment (RI/BRA) (DOE-ID 1997a) was conducted for OU 3-13 to determine the nature and extent of contamination and corresponding potential risks to human health and the environment under various exposure pathways and scenarios. Based on the RI/BRA results, INTEC release sites were further segregated into seven groups based on contaminants of concern, accessibility, or geographic proximity to allow development and analysis of remedial action alternatives which were evaluated in feasibility study (FS) and FS supplement reports (DOE-ID 1997b and DOE-ID 1998). The Other Surface Soils was the designation of Group 3 within OU 3-13. These release sites are designated as “principal threat wastes” due to the potential external exposure of workers or the public to radionuclide-contaminated soils.

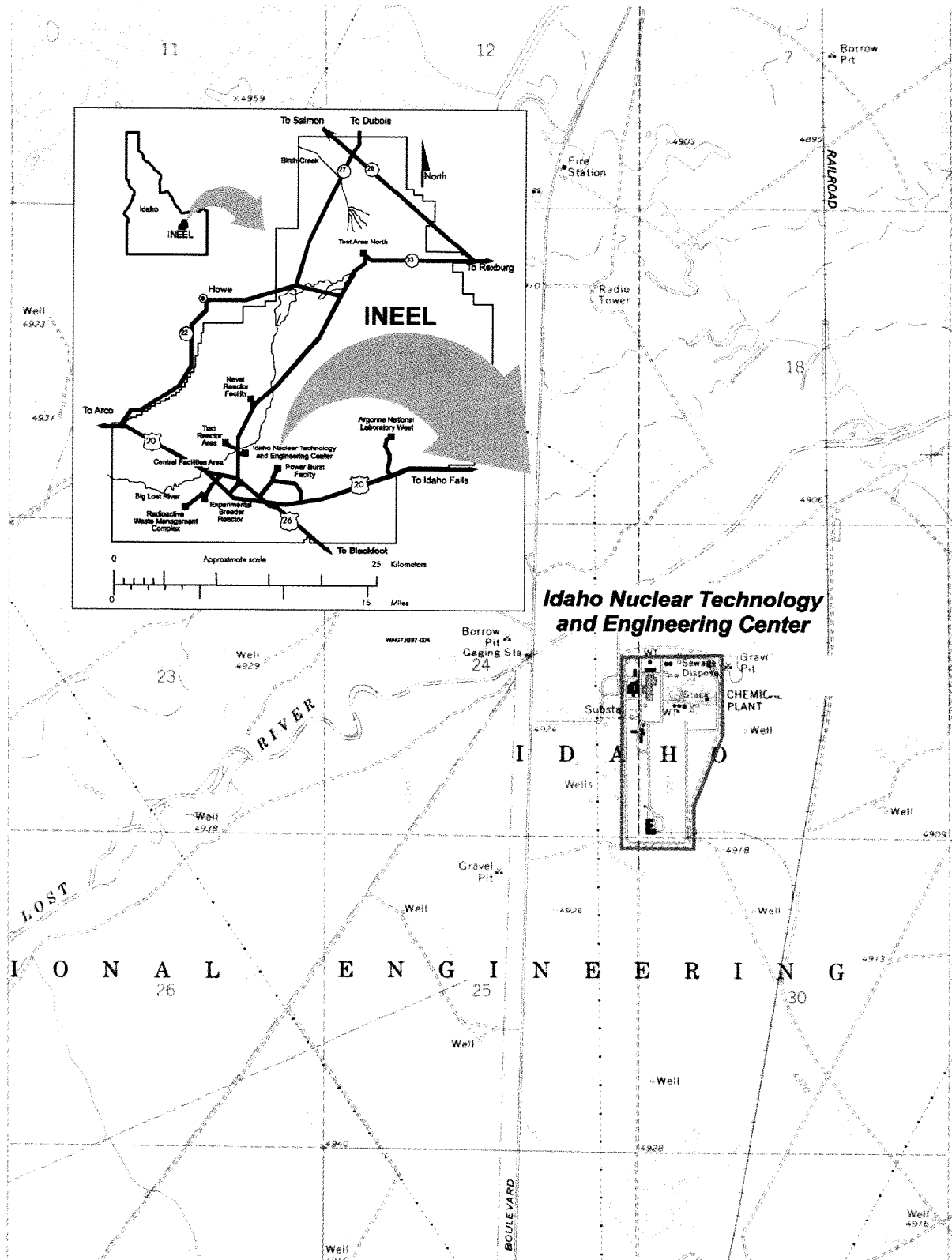


Figure 1-1. Location of INTEC within the INEEL.

1.2 Selected Operational Design

As stated previously, part of the final remedy for Group 3, Other Surface Soils, is removal and on-Site disposal in the ICDF. The ICDF Complex, which is located south of INTEC and adjacent to the existing percolation ponds, is an on-Site, engineered facility, meeting Department of Energy (DOE) Order 435.1, the substantive requirements of Resource Conservation and Recovery Act (RCRA) Subtitle C (42 USC 6921 et seq.), Idaho Hazardous Waste Management Act (HWMA) (HWMA 1983), and Toxic Substances Control Act (TSCA) (15 USC 2601 et seq. 1976) polychlorinated biphenyl (PCB) landfill design and construction. The ICDF Complex includes the necessary subsystems and support facilities to provide a complete waste disposal system.

The major components of the ICDF Complex are the disposal cells, an evaporation pond consisting of two cells, and the SSSTF. The disposal cells, including a buffer zone, cover approximately 40 acres, with a disposal capacity of about 510,000 yd³. Figure 1-2 shows the location of the ICDF Complex to be constructed on the southwest side of INTEC.

The SSSTF is designed to provide centralized receiving, inspection, and treatment necessary to stage, store, and treat incoming waste from various INEEL CERCLA remediation sites prior to disposal in the ICDF, or shipment off-Site. All SSSTF construction and operational activities take place within the WAG 3 area of contamination (AOC) (CPP-95) to allow flexibility in managing the consolidation and remediation of wastes without triggering land disposal restrictions (LDRs) and other RCRA requirements, in accordance with the OU 3-13 ROD. Only low-level, mixed low-level, hazardous, and limited quantities of TSCA wastes will be treated and/or disposed of at the ICDF. ICDF leachate, decontamination water, and water from CERCLA well purging, sampling, and development activities will be disposed of in the ICDF evaporation pond.

1.2.1 Preparatory Design Activities

Initial design activities for the SSSTF were first presented for review in the *Conceptual Design Report (CDR) for the SSSTF* (DOE-ID 2000b). This report provided a conceptual design of the SSSTF facilities, including the administration building, waste staging and storage areas, a waste treatment facility, and supporting utilities. Also included in the CDR were the design criteria, alternatives considered, a description of the treatment process design, a discussion of codes and standards, and estimated capital and life-cycle costs.

Following Agency review and comment resolution on the SSSTF CDR, the *Preliminary Design Report (PDR) for the SSSTF (30% Design)* was submitted for review, and comments were incorporated into the Final SSSTF PDR in December 2000 (DOE-ID 2000c). This design report was developed to provide a basis for this RD/CWP. The PDR contained the SSSTF/ICDF Complex operational concept, preliminary design criteria, a description of the preliminary design for each of the major SSSTF facilities, an RD/RA implementation plan, and detailed cost estimate.

The PDR also provided drawings, specifications, and a number of Engineering Design Files (EDFs) providing various decision analyses for the SSSTF. The relevant EDFs used for the preparation of the RD/CWP are presented below.

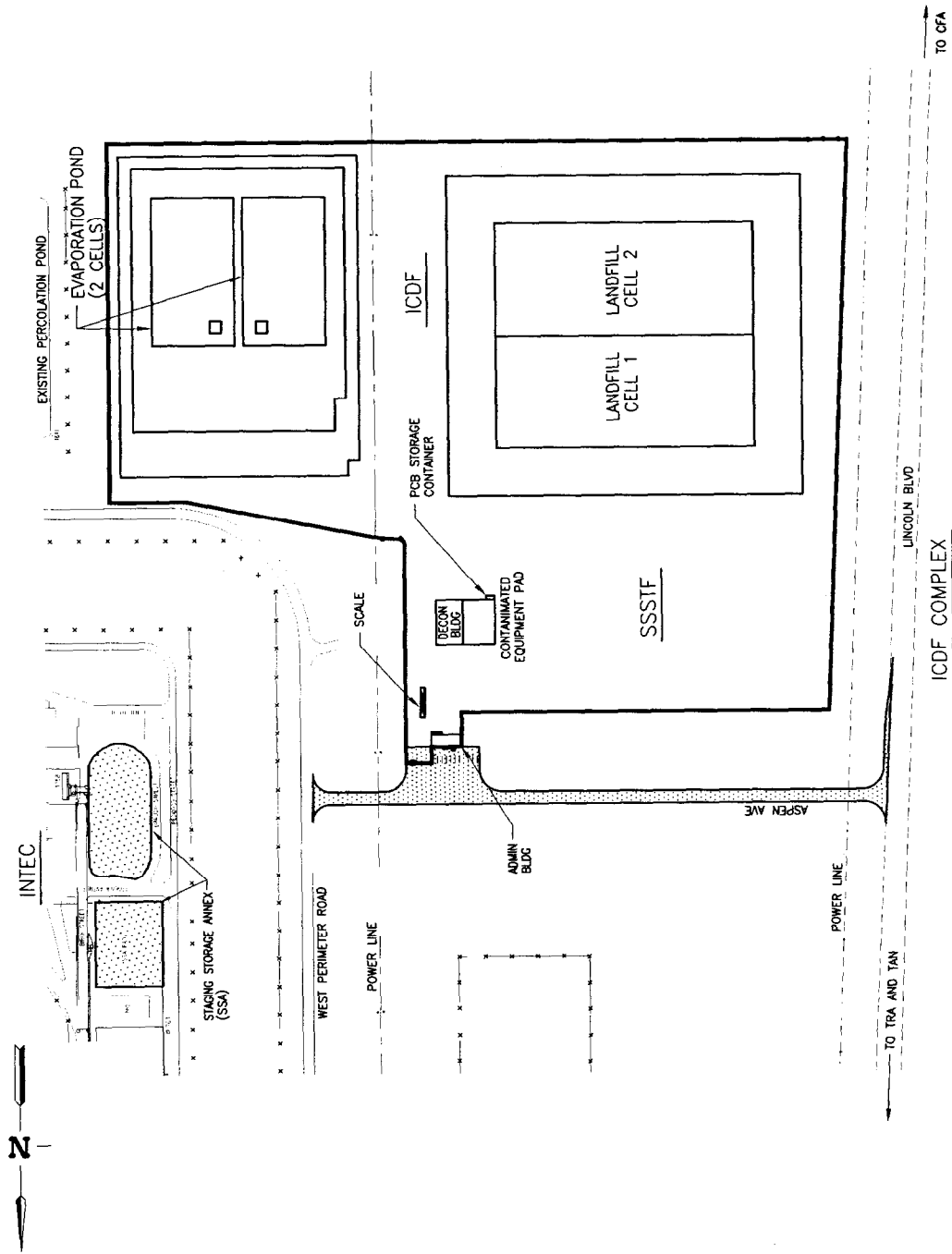


Figure 1-2. Location of the ICDF/SSSTF.

- **EDF-1540—Waste Inventory Design Basis** includes radiological, organic, and inorganic contaminant data on all the waste streams that were anticipated to be disposed at the ICDF landfill based on data in the *CERCLA Waste Inventory Database Report for the Operable Unit 3-13 Waste Disposal Complex* (CWID) (DOE-ID 2000d) and process knowledge. An analysis of available waste data determined that no waste sites require organic treatment.
- **EDF-1545—Waste Staging and Storage Criteria** presents the staging and storage requirements for the SSSTF based on the other EDFs developed for the 30% design. Specific hold points for staging and storage were determined. The best method for accomplishing the required storage was determined in combination with regulatory guidelines, historical data, and best engineering judgment. Contingency was provided for waste not characterized to date.
- **EDF-1547—SSSTF/ICDF Operational Scenario and Process Flows** contains the engineering process diagrams, process descriptions, safety requirements, and system operation and maintenance scenarios for the SSSTF. This EDF was used to assist in the definition of project requirements in support of 30% design activities.
- **EDF-1548—Siting Study** evaluated three proposed sites for the SSSTF. The primary siting criteria included location, land use, geology/topography, flood plain, environmental impact, space/layout utilities, and proximity to support services. The siting information was input into a decision analysis software and evaluated.

Additionally, the PDR updated the “Technical and Functional Requirements WAG 3 Staging, Storage, Sizing, and Treatment Facility” from the CDR, TFR-17 (see Appendix A). Besides listing the design requirements for the SSSTF, the technical and functional requirements (T&FRs) also contained the applicable or relevant and appropriate requirements (ARARs) for the SSSTF. The T&FRs were again revised for this RD/CWP and are presented in Appendix A.

1.2.2 Phased Design Approach

Based upon the Agencies’ design comments on the PDR and subsequent discussions between the Agencies and associated DOE budget, an approach for optimizing the SSSTF and ICDF work scopes was developed. Other issues, such as ICDF waste acceptance criteria (WAC) definition, treatability studies, better definition of waste generation, and economic benefits associated to reduced project risks, were also supportive of this approach, which is to reduce to the scope of the SSSTF from that described in the OU 3-13 RD/RA SOW. The SSSTF work scope has been reduced to only those activities required for ICDF direct disposal implementation with minimal treatment.

These activities include the utilities, roads and grounds improvements, truck and container decontamination facilities, scales, waste receiving and disposal data control systems, administrative facilities, and related security and safeguard structures needed to support the ICDF landfill and evaporation pond construction and direct disposal operations. In addition, limited treatment capabilities are available to treat small volumes of waste and secondary waste streams generated during SSSTF and ICDF operations. These design activities are currently well defined and consequently represent low risk for significant future revisions to design if implemented during the construction phase of the ICDF landfill. A detailed layout of the SSSTF is presented in Figure 1-3, showing all of the associated support facilities.

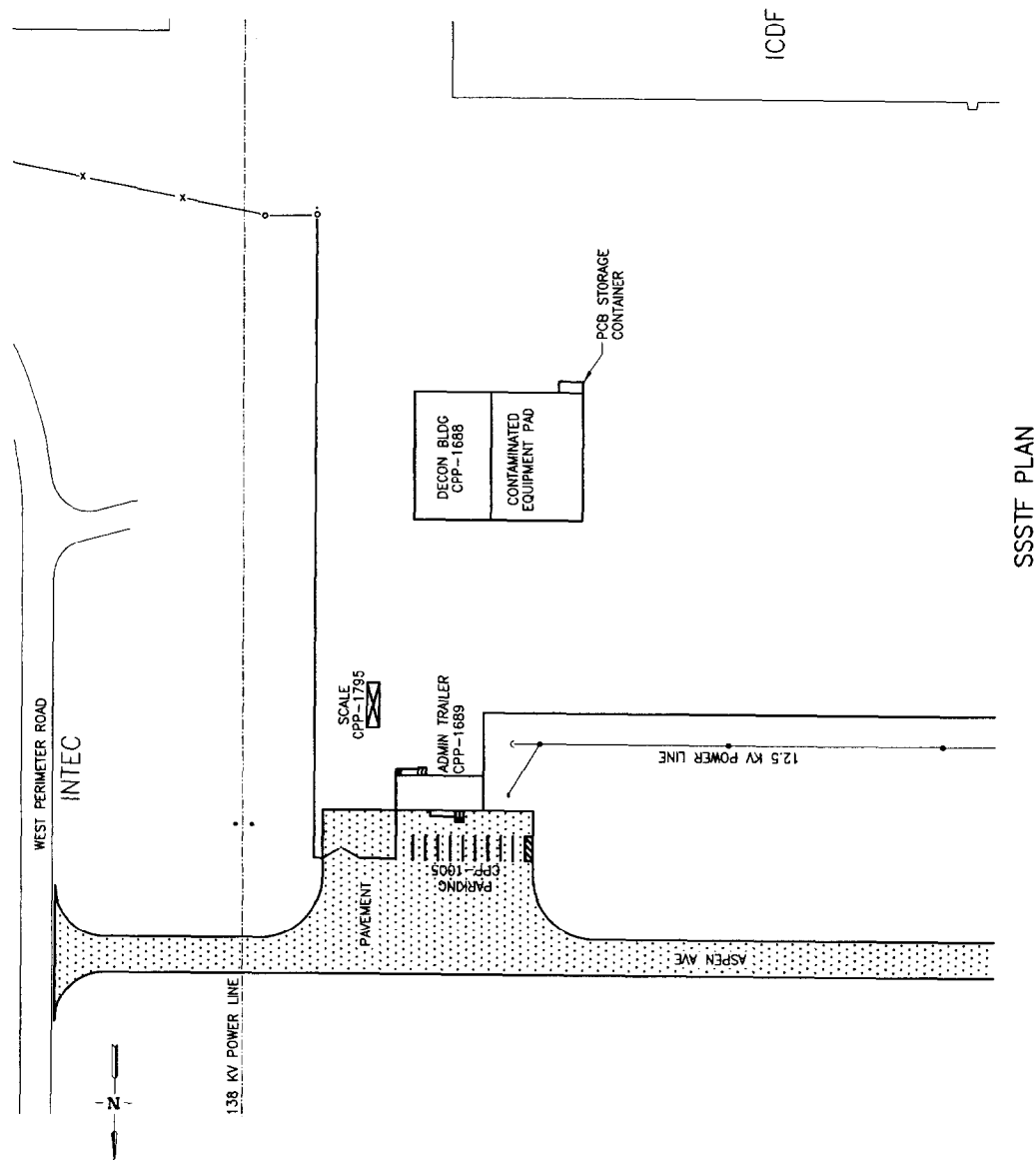


Figure 1-3. Layout of SSSTF.

Further investigation of known or potential waste streams has not resulted in the need for a larger treatment facility than is currently planned in this RD/CWP. If, in the future, the need for a larger or additional type of treatment is identified, scoping would be initiated along with the subsequent development of FFA/CO design and operational documents. If the additional treatment capacity or type is identified, a modification to the OU 3-13 RD/RA SOW will be developed and submitted to the Agencies for incorporation.

1.3 RD/CWP Organization

This RD/CWP is a comprehensive document containing all design information with supporting documentation for constructing the SSSTF as part of the ICDF Complex. Section 1 introduces the project and summarizes the background information for the project site. Section 2 outlines the basis for the design of the SSSTF remedy (e.g., standards, codes, assumptions), while Section 3 describes the actual design of the remedy. Section 4 presents the work plan, which describes the construction work elements and how they are implemented, both physically and from a management standpoint. The references used in the document are contained in Section 5.

The appendices for this work plan contain the EDFs and documents developed for designing and constructing the facility. The appendices also contain the schedule and cost estimate for construction, operations, and closure of the facility. A description of each of these is provided below:

Appendix A—Technical and Functional Requirements, WAG 3 Staging, Storage, Sizing, and Treatment Facility (T&FR-17). This document defines the design requirements for the SSSTF to the extent the requirements are known during its development. The T&FRs were developed as part of the CDR, updated for the PDR (30% design), and revised to its current state as the design matured to the 90% level. The T&FRs also provide the specific environmental and safety requirements for the SSSTF and the location of these requirements within this RD/CWP submittal demonstrating compliance. These requirements are imposed by the ARARs identified in the OU 3-13 ROD.

Appendix B—Design Basis. This appendix contains multiple EDFs and documents that were developed to provide a basis for the design of the SSSTF.

- B-1. Process and Treatment Overview for the Minimum Treatment Process (EDF-ER-296). This EDF describes the process for treating soil waste to meet the ICDF landfill WAC and presents a performance specification for the treatment equipment
- B-2. Staging, Storage, Sizing, and Treatment Facility Debris Treatment Process Selection and Design (EDF-ER-1730). The purpose of this EDF is to analyze possible debris treatment options and to select a debris treatment process and design to be included in the SSSTF.
- B-3. Sanitary Sewer Lift Station (EDF-1937). This EDF contains the calculations for the sanitary sewer lift station design for the ICDF Complex. This EDF provides design flow rates and pump sizing for pumping the sewage generated at the ICDF Complex to the INTEC sewage treatment facility.
- B-4. Raw Water and Potable Water (EDF-2655). This EDF contains the flow and pressure calculations for piping system to the ICDF Complex from the INTEC.
- B-5. INTEC Fire Water System for the ICDF Complex (EDF-1948). This EDF provides the calculations and verification that the volume of fire water to support the ICDF Complex is available from the existing INTEC fire water supply.

- B-6. Process Systems Drain Pipe Sizing (EDF-2648). This EDF documents the geometry and design of the contaminated equipment storage pad, piping, trenching, and lift station to ensure enough capacity and flow to contain and discharge the fire water volumes to the evaporation pond system in the event that there is a fire in the decontamination building.
 - B-7. Decontamination Facility HVAC System (EDF-2676). This EDF contains the heating and ventilation calculations required to develop the design basis for the decontamination building.
 - B-8. SSSTF Design Radiological Control Analysis (EDF-ER-302). This EDF addresses the radiological control issues for waste treatment and decontamination of equipment within the decontamination building. It also identifies radiological control requirements for worker safety.
 - B-9. Fiber Optic Selection (EDF-2738). This EDF provides the design basis for selection and design of the fiber optic system to be used for communications at the ICDF Complex.
 - B-10. Electrical Load Study (EDF-2747). This EDF assesses all loads required to be fed from the new feed and sizes the transformer necessary to provide the required power.
 - B-11. Access Road and Site Pavement Ballast Requirements (EDF-1913). This EDF contains the calculations for the ballast requirements for the SSSTF access road and site pavement.
 - B-12. Post-Tensioned Slab Design (EDF-3061). This EDF documents the design of the post-tensioned slabs in the decontamination building and the contaminated equipment holding pad adjacent to the decontamination building.
- Appendix C—Design Specifications. These specifications have been developed for construction of the SSSTF utility connections and minimum infrastructure. This appendix also includes the procurement specification for the administration office trailer.
- Appendix D—Design Drawings. These drawings have been developed for construction of the SSSTF utility connections and minimum infrastructure.
- Appendix E—SSA As-Built Drawings, Design Drawings, and Specifications.
- Appendix F—Preliminary Inspection Plan for SSSTF Construction Activities (INEEL/EXT-01-00777). This plan defines the overall scope and types of inspections planned for the SSSTF during construction. This plan includes a general overview to ensure construction complies with the specifications and drawings.
- Appendix G—Health and Safety Plan for Construction of the Staging, Storage, Sizing, and Treatment Facility. This Health and Safety Plan (HASP) describes the health and safety requirements for SSSTF construction.
- Appendix H—Construction Waste Management Plan for the Staging, Storage, Sizing, and Treatment Facility. This plan describes the process and requirements for managing waste generated during construction only.
- Appendix I—Storm Water Pollution Prevention Plan for Construction of the SSSTF. This plan has been developed for construction of the SSSTF utility connections and minimum infrastructure.

Appendix J—ICDF Complex Waste Acceptance Criteria. This document outlines the criteria for accepting waste into the ICDF Complex and the procedure to disposition the waste to the applicable unit within the Complex. It also outlines the requirements for acceptance into the treatment units and the acceptable criteria for treated waste.

Appendix K—Quality Program Plan for the INEEL CERCLA Disposal Facility Complex. This plan establishes quality assurance requirements for both the construction and operation of the ICDF Complex.

Appendix L—Schedule and Assumptions.

Appendix M—Cost Estimate.

Appendix N—Soils Stabilization Treatment Facility Design. This document is to be provided at a later date.

Appendix O—Comment Responses. These are tables of draft and draft final comments received from EPA, IDEQ, and internally (DOE-BBWI) and responses to those comments.

2. DESIGN BASIS

This RD/CWP, which has been developed for SSSTF activities, includes the design for necessary utilities, roads and grounds improvements, truck and container decontamination and treatment facilities, scales, waste receiving and disposal data control systems, administrative facilities, and related security and safeguard structures needed as minimum infrastructure to support the ICDF Complex operations. In addition, this Work Plan addresses the limited treatment capabilities that are available for small volumes of waste. The following parameters were used as the basis for the design of the SSSTF activities:

- Design criteria
- DOE-related codes, standards, and documents
- Engineering standards
- Environmental and safety requirements
- Management control procedures (MCPs)
- Status of the OU 3-13 ROD assumptions
- Design assumptions
- Plans for minimizing environmental and public impacts
- Quality assurance requirements
- Identification of unresolved data needs.

These parameters and how they were used in developing the design are presented in the following subsections.

2.1 Design Criteria

The design criteria establish the specific design requirements and criteria for the SSSTF. The design requirements contained in this section can be traced to the requirements in TFR-17, “Technical and Functional Requirements WAG 3 Staging, Storage, Sizing, and Treatment Facility” (see Appendix A). Traceability is established through the T&FR to the requirements presented in the OU 3-13 ROD. The revised T&FRs specifically developed for the utilities and minimum infrastructure design activities are provided in Appendix A. A table of all changes in TFR-17 from the CDR to the PDR to the SSSTF design is included with the T&FRs. The design criteria thus provide a development process anchor, ensuring that the requirements can be maintained, even in the event that future system design iterations change the nature of the system or processes.

The Staging and Storage Annex (SSA), incorporated as part of the SSSTF for design and construction per this RD/CWP, is already located within the INTEC fenced area and serves as a temporary staging and storage area for INEEL CERCLA waste designated for:

- Direct disposal to the ICDF landfill or evaporation pond

- Staging, storage, or treatment in the SSSTF
- Packaging in preparation for off-Site disposal
- Other INEEL on-Site disposal.

Wastes from WAG 3 and other CERCLA actions within the INEEL boundaries will be stored at the SSA during the design and construction of the ICDF Complex.

Although included as part of the SSSTF, the design requirements for the SSA are not included in the design criteria for the SSSTF since this facility has already been constructed. The SSA construction drawings, specifications, and as-built drawings are included in Appendix E, SSA As-Built Drawings, Design Drawings, and Specifications.

2.1.1 General Site and Utilities

This section identifies the requirements and design criteria imposed on the SSSTF regarding siting of the SSSTF and provisions for utilities. The design criteria can be traced to the criteria implemented in the T&FR requirement(s).

The SSSTF shall be designed as a Radiological, Low-Hazard Facility. Additionally, based on preliminary information from the safety classification of structures, systems, and components (SSCs), determined in accordance with DOE 5480.30, DOE 5480.23, and DOE-STD-3009-94, the SSSTF has no safety class, nor safety-significant systems.

Further, no SSCs that perform an emergency function to preserve health and safety during and after a natural phenomena hazard (NPH) event are expected to be identified. The SSSTF shall be designed as a NPH category performance category (PC) -1 facility. Performance category (PC) is the parameter used in the design and analysis of new and existing DOE facilities. This parameter ensures that the level of conservatism used in the NPH design or evaluation process is appropriate for facility occupancy and other characteristics such as importance, cost, hazards to people onsite, people offsite, and the environment. Various criteria and levels of rigor are associated with the design and analysis of DOE facilities, depending on the PC of the facility. The process of determining the PC for any SSC is given in DOE-STD-1021. As stated above, for the SSCs of the SSSTF, the PC has been determined to be PC-1. This is defined in the above standard as follows: (a) an SSC with potential human occupancy or (b) SSC failure may cause fatality or serious injuries to in-facility workers or SSC failure can be prevented cost-effectively by NPH design. Additionally, to be a PC-1 facility, there need to be no "safety class" or "safety significant" SSCs as defined by the safety analysis (SA).

2.1.1.1 Roadways. Roadways are designed to alleviate heavy traffic on existing thoroughfares and provide circulation efficiency within the new facility. The roadways required include a new link from Lincoln Blvd. to the perimeter road around INTEC and new interior circulation roads within the ICDF Complex linking the SSSTF, the ICDF landfill, and the ICDF evaporation pond. The roadway between Lincoln Blvd. and the SSSTF eliminates excessive truck traffic related to the SSSTF as well as separate heavy vehicle traffic from the personnel transport vehicles on the main access road to INTEC.

All SSSTF roadways shall be designed and constructed in accordance with *DOE-ID Architectural Engineering Standards* (DOE-ID 2001a) and the State of Idaho Transportation Department, Division of Highways, Standard Specification for Highway Construction. Road and site pavement design is documented in EDF-1913, "SSSTF Access Road and Site Pavement Ballast Requirements," provided in Appendix B-11.

2.1.1.2 Parking. The SSSTF shall provide vehicle parking as follows:

- Administration building:
 - Nine spaces for employee vehicles
 - One handicapped space for employee vehicle.
- Holding area:
 - Twenty spaces for empty roll-on/roll-off containers located east of the decontamination building.
- Heavy equipment parking:
 - Ten spaces with head bolt heaters for heavy equipment parking during cold weather shutdown of operations. The heavy equipment is utilized in the operations of the landfill.

Design of paving for all access roads and site paving is documented in EDF-1913 in Appendix B-11.

2.1.1.3 Radiological and Dust Control. The design includes establishment of acceptable limits for contamination, provisions for physical and administrative safeguards, and controls to limit and/or confine exposure to contaminants. Radiation is required to be controlled at the source. Radiological control instrumentation is required to verify that this is being accomplished. The following is a list of the overall design basis for the SSSTF regarding radiological and dust controls:

- The SSSTF design and physical controls shall be optimized to assure that occupational exposure is maintained as low as reasonably achievable (ALARA). Regarding the control of airborne radioactive material, the design objective shall be to avoid release to the workplace atmosphere and, in any situation to control the inhalation of such material by workers to levels that are ALARA, confinement and ventilation shall normally be used.
- The SSSTF shall include design provisions to limit (through physical design features and administrative control) emissions of radionuclides to not exceed levels established in DOE O 435.1 and to comply with NESHAP emission limits.
- The SSSTF shall include design provisions to control dust to a level to ensure compliance with the American Conference of Governmental Industrial Hygienists (ACGIH) standards.
- No controls shall be installed at any exit that would prevent rapid evacuation of personnel under emergency conditions.

The “SSSTF Design Radiological Control Analysis” (EDF-ER-302) provided in Appendix B-8 addresses the radiological control issues for waste treatment and decontamination of equipment within the decontamination building. It also identifies radiological control requirements for worker safety.

2.1.1.4 Fences. The SSSTF shall provide a means to prevent the unknowing entry, and minimize the possibility for the unauthorized entry, onto the facility. A 6-ft-high, chain-link fence shall be constructed around the perimeter of the Complex as required for a chemical waste landfill for PCBs as specified in 40 CFR 761.75(b)(9). The fence shall be grounded in accordance with *DOE-ID Architectural Engineering Standards*. A sign stating “Danger – Unauthorized Personnel Keep Out” shall be posted at

each entrance and on each side of the active portion of a facility. Additionally, correct CERCLA signage will be installed to comply with regulatory requirements.

2.1.1.5 Electrical Power. The SSSTF shall be provided 480 V, three-phase, 60 Hz, normal electrical power in accordance with the *DOE-ID Architectural Engineering Standards*. As the design progresses, an interface agreement will be developed between the SSSTF and the INTEC facilities. The “Electrical Load Study” (EDF-2747) provided in Appendix B-10 defines the approximate power needs as 513 kW which includes a 25% growth factor (i.e., treatment equipment). This is based on the following loads:

Administration trailer	40.0 kW (assumption)
Decontamination facility	304.5 kW (based on panel schedule)
Head bolt heater rack	15.6 kW (based on panel schedule)
ICDF	50.0 kW (based estimate from ICDF engineering)
<hr/>	
Total	410.1 kW * 1.25 = 513 kW

Power for the ICDF Complex is supplied from the existing 12.47 kV line that runs along the east side of Lincoln Blvd. west of the ICDF Complex. The line is supplied from the Scoville Substation and is strictly for normal or commercial power. No standby or emergency power is available from this line. Standby power is not provided to the SSSTF based on the scope of the current design.

2.1.1.6 Sanitary Sewer. The SSSTF shall be provided a sanitary sewer line in accordance with *DOE-ID Architectural Engineering Standards* capable of handling peak demand from sanitary facilities installed at the administration and the decontamination buildings. Peak demand is based on the number of drainage fixture units at the ICDF Complex, which is equal to 46.5. Under the uniform plumbing code, 46.5 drainage fixture units are equivalent to a design flow of 24 gpm. The sanitary wastewater from these facilities is collected in a lift station and then pumped approximately 1,700 ft to a manhole inside INTEC that is connected to the INTEC sanitary wastewater system. From here, the wastewater is sent to the INTEC wastewater treatment plant. The calculations for the determining the design flow rate and for sizing the lift station pumps are provided in Appendix B-3, SSSTF Sanitary Sewer Lift Station (EDF-1937).

2.1.1.7 Potable Water. Potable water shall be supplied to the administration and decontamination buildings for drinking, showers, and sanitary purposes. Potable water is distributed throughout the INTEC through the potable water distribution system with three potable water pumps. The main pump is on continuously and delivers 60 gpm at 80 psi, while the other two pumps deliver 120 gpm apiece. Normal potable water demand for the plant is less than 60 gpm, and the two larger pumps rarely operate.

Potable water is delivered to the various facilities at INTEC through the potable water distribution system through a series of distribution mains starting with a 6-in. line, then reducing to a 4-in. line and eventually reducing to a 3-in. line. Because the flows for the ICDF Complex are expected to be less than 10 gpm, the losses throughout the system including the INTEC distribution system are less the 0.1 psi/100 ft. This results in less than 6 psi drop from the potable water pumps to the ICDF Complex. Because of the minimal pressure losses and flow volumes required at the ICDF Complex, no formal calculations were required for the SSSTF potable water line for flow or pressure losses. Adequate potable water is available at each facility at approximately 70 psig. Additional details regarding the potable water design basis are provided in Appendix B-4, Utilities-Raw Water and Potable Water (EDF-2655).

2.1.1.8 Raw Water. The SSSTF shall be provided raw water in accordance with *DOE-ID Architectural Engineering Standards*. Raw water service is also provided to the ICDF at the south boundary of the SSSTF.

Raw water at INTEC is pumped from two deep wells into storage tanks for delivery to the various water systems throughout the facility. Raw water is taken from the storage tanks and distributed by three pumps. The main pump delivers 1,500 gpm at 100 psi and the two additional pumps deliver 2,500 gpm and 3,000 gpm. The pumps are sequenced to operate in stages based on system supply pressure. Normal raw water demand for the plan is less than 1,500 gpm and the two larger pumps rarely operate. Raw water is available at 550 gpm and 60 psig at the boundary to the ICDF Complex. Calculations to estimate flow and pressure loss for the system at the ICDF Complex boundary are also provided in the Appendix B-4, Utilities-Raw Water and Potable Water (EDF-2655).

2.1.1.9 Storm Water. Storm water from the SSSTF shall be managed in accordance with the Storm Water Pollution Prevention Plan for Construction Activities (SWPPP-CA) at the SSSTF. The SWPPP is provided in Appendix I.

2.1.1.10 Wastewater. Wastewater at the SSSTF consists of, but is not limited to, the following waste streams:

- Decontamination water generated from decontamination and treatment activities occurring in the decontamination building
- Storm water runoff from the contaminated equipment storage pad
- Fire water generated at the decontamination facility in the event of a fire.

All wastewater drains into a lift station and is pumped to the evaporation pond. The wastewater piping from the decontamination building and contaminated equipment storage pad requires secondary containment to comply with the OU 3-13 SSSTF ARARs.

In the event of a fire in the decontamination building, the large volume of water generated will be piped and temporarily stored on the contaminated equipment storage pad, which is contained with curbing. To accomplish this, the concrete pad is 1 ft below the finished floor of the building. It is also sloped 0.015 ft/ft away from the building. After the fire, the water will be drained to the lift station where it will then be pumped to the evaporation pond system for disposal. Design of the wastewater collection and pumping system is documented in Appendix B-6, SSSTF Phase 1–Minimum Infrastructure, Process Systems Drain Pipe Sizing (EDF-2648). This EDF includes the design and geometry of the contaminated equipment storage pad, piping, and lift station.

2.1.1.11 Fire Protection and Detection. The ICDF Complex shall be provided with fire water in accordance with the *DOE-ID Architectural Engineering Standards*. Additionally, it shall be provided with a fire detection system with remote alarm reporting capabilities.

A means of egress shall be provided from the administration and decontamination buildings per National Fire Protection Association (NFPA) 101, Life Safety Code Handbook. NFPA 801 requires that discharged fire water from a facility processing radioactive material be contained.

The calculations and verification that the volume of fire water to support the ICDF Complex is available from the existing INTEC fire water supply are provided in Appendix B-5, INTEC Fire Water System for the ICDF Complex (EDF-1948).

2.1.1.12 Telephone and Data Communications. To support the SSSTF operations, personnel will need access to the INEEL data network system. Such data transmission consists email and intranet/internet information. The most important use of the data network system at the ICDF Complex will be the transfer of information to support the waste tracking system.

Data transmission from building to building, area to area, and site to town within the INEEL is made via fiber optic cable. It is necessary for the ICDF Complex to tie into the existing fiber optic network at the INTEC. The telecommunications group that owns and operates the fiber optic systems at the INEEL selected Ethernet hardware to support the anticipated data networking needs of the ICDF Complex. The fiber optic selected is based on the distance to the tie-in point inside INTEC and the hardware requirements. Information regarding the fiber optic selection basis is provided in Appendix B-9, SSSTF Phase 1–Minimum Infrastructure, Fiber Optic Selection”(EDF-2738).

Additionally, the SSSTF shall provide conductors for telephone and data communication services to the administration and decontamination buildings. Telephones shall be provided at the exterior of all personnel exits of the decontamination building to support emergency notifications. Determination of these requirements is based on best engineering judgment derived from experience and resulting lessons learned.

2.1.1.13 Emergency Notification System. The fire alarm system and direct voice provides emergency notification communications with the occupants of each building. If the emergency is within the building, the fire alarm occupant notification system will be activated. Occupants will evacuate to predetermined location and await instructions from the assigned emergency director. If the emergency is initiated from a location outside the SSSTF, the signal will be received on a radio tuned to the emergency warning system. The emergency director will direct the occupants in the proper procedures (take cover or evacuate) depending upon the message from Warning Communications Center (WCC). Occupants will be trained to call WCC in the event of an emergency and to advise the emergency director of the emergency.

2.1.2 Administrative Facilities

This section identifies the requirements and design criteria for the administrative facility of the SSSTF. The administrative facility consists of the administration office trailer and the scales for weighing of trucks entering and exiting the ICDF Complex. Administrative functions include the weighing and verifying of waste coming into or out of the facility, determining waste disposition, administering treatment verification and other quality activities, processing and maintaining required records associated with the waste disposition, and performing overall management functions.

2.1.2.1 Administration Building. This administration building is a temporary, relocatable office space. This trailer consists of two parts and houses a conference/lunchroom area with kitchenette, office space, data tracking technician office, restrooms, and janitor closet. The design and construction specifications for the trailer are provided with the design specification in Appendix C-1 (Procurement Specifications for the Administrative Office Trailer). The trailer is manufactured to comply with all U.S. federal regulations applicable to manufactured housing, including the Federal Highway Administration Department of Transportation (DOT) standards and the Federal Motor Carrier Safety Regulations (FMCSR). The trailer complies with the design requirements for the following occupancy classifications:

- Group B, Type II-N Construction, as defined by the Uniform Building Code, 1997 edition
- New Business Occupancy, as defined by the NFPA 101.

2.1.2.1.1 Structural Requirements—The structural design of the office trailer shall consider the minimum loads listed below. Combinations of these loads shall conform to ASCE 7-98.

- Dead and live: per ASCE 7-98
- Snow: 30 psf minimum roof load
- Wind: per ASCE 7-98, 90 mph 3-second gust speed, Exposure C
- Seismic: per UBC-97, Seismic Zone 2B, Soil Profile S D, I = 1.0.

2.1.2.1.2 Electrical Systems—The electrical systems in the trailer shall be in accordance with the following provisions:

Incoming service:	A 480Y/277-volt, 3-phase, 4-wire, 60-Hz electrical service is available. The total demand for the administrative trailer shall not exceed 50 amperes at 480 volts.
Interior lighting:	Illumination levels shall be as recommended by the Illuminating Engineering Society Handbook.
Emergency/exit lights:	Emergency lighting and exit lighting shall be provided in accordance with NFPA 101, "Life Safety Code."
Code compliance:	The complete installation shall be in accordance with applicable sections of the National Electrical Code including Article 550 – Mobile Homes, Manufactured Homes, and Mobile Home Parks.

2.1.2.1.3 HVAC—The administration trailer shall be provided with standard comfort heating, ventilating, and air conditioning (HVAC) providing a minimum air exchange rate based on American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) standards. The HVAC system shall comply with the requirements listed below:

- The supply air system is operating at a site near INTEC, approximately 50 miles west of Idaho Falls. The 97-1/2% ASHRAE data for this area shall be used for mechanical design purposes.
- The HVAC system shall maintain the following conditions inside the administration office trailer:
 - Summer temperature: 76°F
 - Winter temperature: 72°F
- All ductwork shall conform to Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) specifications and designs to minimize noise and pressure drop.
- Installation of the system shall conform to the manufacturer's recommendations, ASHRAE standards, and NFPA 90A and 90B.

2.1.2.1.4 Telephone and Data Communications—All equipment shall comply with NEC Article 800 for telephone systems and service. All components shall be UL-approved.

2.1.2.1.5 Fire Alarm—The fire alarm system shall be installed in accordance with NFPA 72. The wiring for initiation device circuits shall be Class B, Style B.

2.1.2.1.6 Life Safety—The trailer contains life safety systems that comply with federal fire-protection-related life safety and emergency planning requirements contained in 29 CFR 1910, Occupational Safety and Health standards. NFPA 101 applies where 29 CFR 1910 does not apply or where NFPA 101 exceeds the requirements in the Code of Federal Regulations (CFR). The life safety designs shall include provision for safe access and rapid movement of emergency equipment in accordance with applicable standards.

2.1.2.1.7 Plumbing—Plumbing includes water supply and sewage piping for potable water, drains, waste piping, and vent piping. Also included are plumbing fixtures, pipe supports, and other accessories as needed to provide a complete plumbing system. All piping is installed within the trailer insulation envelope to prevent freezing. Plumbing systems comply with the Uniform Plumbing Code and shall be selected based on the best combination of performance, cost, and maintenance.

2.1.2.2 Scales. A load weighing scale shall be located at the administration building site. This scale shall be used to weigh waste transport vehicles entering and leaving the SSSTF. The scale shall accommodate standard commercial tractor-trailer units and shall have a capacity of 60 tons with an accuracy of within 0.1% of full scale.

2.1.2.3 Waste Verification and Processing. Only waste with approved Waste Approval Forms is processed for staging, storage, treatment, and/or disposal at the ICDF Complex. This function is performed and documented in the administration facility. The status of received waste is also collected (weighed, tracked, and transferred) at the administration facility. All data are electronically transmitted to remote servers at INTEC and the INEEL Supercomputer Center on a real-time basis to maintain secure documentation of all waste. Data regarding waste disposal locations at the landfill are collected at the administration building and electronically stored (controlled) at a remote server separate from the ICDF Complex.

Administrative functions of the SSSTF include having the capability to process waste in a variety of containers. Additionally, the ICDF Complex has the capability to receive and treat a limited quantity of aqueous waste.

The *CERCLA Waste Inventory Database Report for the Operable Unit 3-13 Waste Disposal Complex*, (DOE-ID 2000d) was interpreted and documented in both the “SSSTF Waste Inventory Design Basis” (EDF-1540) and the “ICDF Design Inventory” (EDF-ER-264) for use during the SSSTF design. A detailed description of the WAC is provided in the Appendix J, ICDF Complex Waste Acceptance Criteria. Details regarding the acceptance and processing of waste within the ICDF Complex will be described in the Operations and Maintenance Plan, to be provided as part of the ICDF Complex RA Work Plan.

2.1.3 Decontamination Facility

This section identifies the requirements and design criteria imposed for the decontamination and treatment building at the SSSTF, which is referred to in this document as the decontamination building.

2.1.3.1 General. The decontamination building is used to remove radiological and hazardous contamination from waste transport vehicles, waste containers, and equipment to acceptable radiological and hazardous contamination levels. The building also provides an enclosed facility for waste handling and stabilization of boxed soil. Additionally, an area adjacent to the decontamination building is set aside for TSCA-compliant storage of PCB-contaminated waste.

The decontamination building is designed to accommodate personnel movement, container inspection, and emergency response equipment.

The facility occupancy classification is determined per the recognized building code, Uniform Building Code (UBC). Based on the present scope and the wastes that have been identified along with their quantities needing treatment, the classification is currently identified as a UBC, F-2 for the decontamination facility.

2.1.3.2 Structural Requirements—The structural design of the decontamination building shall consider the minimum loads listed below. Combinations of these loads shall conform to ASCE 7-98.

- Dead and live: per ASCE 7-98
- Snow: 30 psf minimum roof load
- Wind: per ASCE 7-98, 90 mph 3-second gust speed, Exposure C
- Seismic: per UBC-97, Seismic Zone 2B, Soil Profile S D, I = 1.0.

2.1.3.3 Electrical Power. The decontamination building shall be provided 480 V, three-phase, 60 Hz, normal electrical power in accordance with the *DOE-ID Architectural Engineering Standards*. This should be sufficient for providing 304.5 kW based on the panel schedule with an additional 90 kW for the treatment equipment. Standby power is not provided based on the scope of the current design.

2.1.3.4 Plumbing. All piping will be installed to prevent freezing. Plumbing systems comply with the Uniform Plumbing Code and are selected based on the best combination of performance, cost, and maintenance.

2.1.3.5 Sanitary Sewer. The decontamination building shall be provided a sanitary sewer line in accordance with *DOE-ID Architectural Engineering Standards* capable of handling peak demand for two restrooms with showers, a drinking fountain, and a utility sink. The total number of drainage fixture units for the decontamination building is 34.5. Under the uniform plumbing code, 34.5 drainage fixture units are equivalent to a design flow of 17 gpm. The sanitary wastewater from this facility gravity-drains to the sanitary sewer lift station where it is pumped to the INTEC sanitary wastewater system. Additional details are provided in Appendix B-3, SSSTF Sanitary Sewer Lift Station (EDF-1937).

2.1.3.6 Potable Water. Potable water shall be supplied to the decontamination buildings for drinking, showers, and sanitary purposes.

2.1.3.7 Raw Water. The decontamination building shall be provided raw water for decontamination and treatment purposes in accordance with *DOE-ID Architectural Engineering Standards*.

2.1.3.8 Wastewater. Wastewater from the decontamination building consists of, but is not limited to, the following waste streams:

- Decontamination water generated from decontamination of vehicles and equipment
- Wastewater generated during treatment activities
- Fire water generated at the decontamination facility in the event of a fire.

All wastewater generated in the decontamination building drains into collection trenches designed to meet the 40 CFR 264, Subpart DD, "Containment Buildings," requirements. Additionally, the wastewater requires solids removal, which is accomplished by sedimentation in the trench and an oil/water separator installed as a best management practice. However, the primary purpose of the oil/water separator is to remove oily fluids from the wastewater prior to draining into the lift station where it is pumped to the evaporation pond system. The wastewater piping from the decontamination building and contaminated equipment storage pad requires secondary containment to comply with ARARs.

The wastewater piping from the contaminated equipment storage pad and decontamination building is sized large enough that, in the event of a fire in the decontamination building, the volume of water generated will be piped to and temporarily stored on the contaminated equipment storage pad which is contained with curbing. To accomplish this, the concrete pad is 1 ft below the finished floor of the building. It is also sloped 0.015 ft/ft away from the building. After the fire, the water will be drained to the lift station where it will then be pumped to the evaporation pond system for disposal. Design of the wastewater collection and pumping system is documented in Appendix B-6, Process Systems Drain Pipe Sizing (EDF-2648). This EDF includes the design and geometry of the contaminated equipment storage pad, piping, and lift station.

2.1.3.9 Fire Protection and Detection. The decontamination building shall be provided with fire water in accordance with the *DOE-ID Architectural Engineering Standards*. Additionally, it shall be provided with a fire detection system with remote alarm reporting capabilities. The decontamination building contains life safety systems that comply with federal fire-protection-related life safety and emergency planning requirements contained in 29 CFR 1910, "Occupational Safety and Health Standards." NFPA 101 applies where 29 CFR 1910 does not apply or where NFPA 101 exceeds the requirements in the CFR. The life safety designs shall include provision for safe access and rapid movement of emergency equipment in accordance with applicable standards. A means of egress shall be provided from the decontamination buildings per NFPA 101, Life Safety Code Handbook.

The NFPA requires that discharged fire water from a facility processing radioactive material be contained. The volume of water to be contained is calculated by multiplying a discharge of 0.15 gal/ft² over the most remote 3,500 ft² of the facility and the discharge from a fire hose of 250 gpm for a period of 30 minutes. This amounts to a flow of 775 gpm for a total volume of 23,250 gal for the time period. The calculations for this volume and a description of how the water are drained out of the building to the contaminated equipment storage pad and then to the lift station is provided in Appendix B-6, Process Systems Drain Pipe Sizing (EDF-2648).

The calculations and verification that the volume of fire water to support the ICDF Complex including the decontamination building is available from the existing INTEC fire water supply is provided in Appendix B-5, INTEC Fire Water System for the ICDF Complex (EDF-1948).

2.1.3.10 Telephone and Data Communications. Conductors for telephone and data communication services are provided to the decontamination building. Telephones are provided at the exterior of all personnel exits of the decontamination building to support emergency notifications. All equipment shall comply with NEC Article 800 for telephone systems and service and all components shall be UL-approved.

2.1.3.11 Emergency Notification System. The fire alarm system and direct voice provides emergency notification communications with the occupants of the decontamination building. If the emergency is within the building, the fire alarm occupant notification system will be activated. Occupants will evacuate to predetermined location and await instructions from the assigned emergency director. If the emergency is initiated from a location outside the ICDF Complex, the signal will be received on a radio tuned to the emergency warning system.

2.1.3.12 Heating, Ventilation, and Air Conditioning. The decontamination building shall be provided with a once-through high-efficiency particulate air (HEPA) filter exhaust ventilation system capable of providing a minimum air exchange rate based on a UBC F-2 occupancy classification.

The HVAC system provides negative air pressure in relation to the external environment. The negative air pressure assists in the confinement of airborne radiological and hazardous constituents.

2.1.3.13 Radiological and Dust Control. The design includes establishment of acceptable limits to contamination, provisions for physical and administrative safeguards, and controls to limit and/or confine exposure to contaminants. The radiation is required to be controlled at the source. Radiological control instrumentation is required to verify that this is being accomplished. The following is a list of overall design basis for the decontamination building regarding radiological and dust controls:

- The design and physical controls shall be optimized to assure that occupational exposure is maintained ALARA. Regarding the control of airborne radioactive material, the design objective shall be to avoid release to the workplace atmosphere and, in any situation to control the inhalation of such material by workers to levels that are ALARA, confinement and ventilation shall normally be used.
- The decontamination building design supports the use of automated personnel contamination monitors (PCMs).
- Design provisions are included to limit (through physical design features and administrative control) emissions of radionuclides to not exceed levels established in DOE O 435.1 and to comply with NESHAP emission limits.
- The SSSTF shall include design provisions to control dust to a level to ensure compliance with the ACGIH standards. Appropriate precautions per Idaho Administrative Procedures Act (IDAPA) 58.01.01.650 include the use of water or chemicals, application of dust suppressants, or use of control equipment.
- No controls shall be installed at any exit that would prevent rapid evacuation of personnel under emergency conditions.

The “SSSTF Design Radiological Control Analysis” (EDF-ER-302) provided in Appendix B-8 addresses the radiological control issues for waste treatment and decontamination of equipment within the decontamination building. It also identifies radiological control requirements for worker safety.

2.1.4 Waste Treatment Process

The SSSTF provides minimum treatment capabilities to treat small volumes of waste and secondary waste streams generated during SSSTF and ICDF operations. The meaning of “minimum treatment” is a design capacity that accommodates the soil and debris wastes from the WAG 3 Sites CPP-92, CPP-98, CPP-99; WAG-1 Site TSF-07; WAG 4 Site CFA-04; and limited debris from deactivation, decontamination, and decommissioning (D&D&D) activities. In addition, minimum treatment capabilities include treating small volumes of aqueous liquids/sludges containing chemical and radiological constituents similar to those of the soil wastes. This results in reducing the waste potentially requiring treatment from about 36,000 to 2,660 yd³ (including the 600 yd³ of debris), which allows significant modifications to the process and facilities proposed in the PDR. The most significant deviation is the elimination of a separate treatment building for processing the wastes. Instead, a portion of the decontamination facility is used for treating the waste. The minimum treatment system is housed in a dedicated section of the decontamination building.

The rationalizations for the decrease in waste volumes requiring treatment are as follows:

- WAG 1 Sites WRRTF-01 (20,000 yd³) and TSF-03 (1,000 yd³) are designated for capping in place. There might be a possibility the waste could come to the ICDF Complex facility pending ongoing tests but the waste is currently slated for a cap. The WAG 1 ROD (DOE-ID 1999b) states that the selected remedy for the two burn pits (TSF-03 and WRRTF-01) is a native soil cover.
- Soil samples from WAG 5 Site ARA-12 (2,000 yd³) were collected and analyzed for toxicity characteristic leaching procedure (TCLP) metals. The data showed that the site is not characteristic for metals. These data are presented in the Revised Result Table for TCLP Metals Analysis of Samples from the Segmented Gate System Treatability Study- ARA 12 Sampling Project (12-NOV-00, MMJ-127-00).
- The Draft WAG 10 ROD, which is currently scheduled for Agency review by May 1, 2002, identifies STF-02 (gun range) as a possible source of lead-contaminated soil (14,900 m³), but the soil will go through a separations process to extract the lead fragments prior to disposal. There are no projections of expected volumes of soil requiring stabilization until process testing has been completed.

2.1.4.1 Wastes Designated For Minimum Treatment. The minimum treatment option targets wastes from WAG 3 Sites CPP-92, CPP-98, CPP-99; WAG 1 Site TSF-07; WAG 4 Site CFA-04; and limited debris from D&D&D activities. The CPP-92, CPP-98, CPP-99, and TSF-07 wastes are packaged in plastic-lined wooden boxes measuring either 2 × 4 × 8 ft or 4 × 4 × 8 ft. The boxes of wastes have been further categorized as being either "soil" or "debris." The WAG 3 sites are estimated to contain approximately 1,260 yd³ of soil and 562 yd³ of debris, and TSF-07 is 1 m³ of debris.

The CFA-04 waste is estimated at approximately 800 yd³ of mercury-contaminated soil above LDRs; however, wastes from CFA-04 and D&D&D have not yet been generated. D&D&D wastes are further discussed in the CWID (DOE-ID 2000d) in which 72 yd³ of mixed low-level waste (MLLW) and hazardous waste fractions are identified for debris treatment. The CFA-04 waste may be shipped in bulk containers, rather than boxes.

2.1.4.2 General Treatment Design. The treatment process in the decontamination building shall treat boxed, non-aqueous waste to meet LDR and ICDF landfill WAC levels. Following treatment, the treated waste that meets the ICDF landfill WAC is transported to the landfill for final disposition. Treated waste that fails to meet the ICDF landfill WAC requirements shall be reprocessed in the decontamination building treatment facilities. The treated waste is also required to contain no free liquid as determined by visual examination and the paint filter test (as defined in Paint Filter Liquids Test SW-846 Method 9095) (EPA 1986). Additional requirements for treatment of both debris and soil include

- The treatment process is designed to prevent releases of waste to ensure protection of human health and the environment.
- The treatment process equipment shall be able to be decontaminated.
- Measures shall be taken during SSSTF stabilization operations in the decontamination building to maintain radiation exposure in controlled areas ALARA through facility and equipment design and administrative controls. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). The proposed physical controls are an environmental enclosure with filtered air. Additionally, air emissions from the stabilization process shall meet National Emission Standards for Hazardous Air Pollutants (NESHAP) and Idaho dust emission standards.

A more detailed design basis and description of how the treatment processes for soils and debris were selected are provided in Appendix B-1, Process and Treatment Overview for the Minimum

Treatment Process (EDF-ER-296), and Appendix B-2, SSSTF Debris Treatment Process Selection and Design (EDF-1730).

2.1.4.3 Soil Stabilization Treatment Process. The PDR identified a Portland cement-based system as a viable method of treating the identified waste soils. These soils are assumed to contain heavy metals as the only contaminants of concern; organic contaminants were either below regulatory concern or nonexistent in the waste forms. Based on this assumption, the object of cement stabilization was to produce a treated soil that met the following criteria:

- Reduce the heavy metal leachability to LDR/UST levels to meet the ICDF landfill WAC
- Exhibit no free liquid.

Additionally, the stabilized soil should have a friable or crumbly consistency to allow easier post-treatment handling of waste.

A procurement specification detailing the requirements for the soil treatment system is included as an appendix to EDF-ER-296, which is Appendix B-1. The treatment process must deliver a product meeting the criteria listed above and meet the following requirements and constraints:

- The waste throughput is 10 yd³ per day.
- The waste must be removed from 2 × 4 × 8-ft wooden boxes, roll-on/roll-offs, or other approved containers.
- Boxes of soil waste to be treated are assumed 85% full and weigh up to 8,000 lb.
- Reagents include fine flowable solids (cement, flyash, granulated blast furnace slag), water, and small quantities (less than 1 gal) of liquid reagents.
- Dust from the waste materials must be contained within the treatment system or collected in some manner to minimize the spread of contamination.
- The footprint of the mixer and peripheral equipment must reside in a 900-ft² area, with a roof height of 17 ft at the eave and 21 ft at the pitch. (These dimensions would allow the equipment to be compatible with the current building design.)
- The unit must be able to accommodate aqueous waste liquids/sludges.
- The unit shall have decontamination features, such as spray wands for water washing.

A summary of the design requirements for the soil treatment system are provided below.

2.1.4.3.1 Mixer—The mixer shall be capable of providing a homogeneous blend of soil and reagent and have a minimum capacity of 13,000 lb. The system must be robust enough to provide mixing for a wide range of feed with aggregates up to 6 in. while at the same time providing enough sheer to generate a homogeneous mixture. At the same time, the mixer must be able to accept and adequately mix aqueous liquid/sludge wastes with no leakage.

After the mixer has produced a homogeneous blend of contaminated soil and reagent, the mixer shall be capable of delivering the soil into empty boxes (2 × 4 × 8 ft) or, alternatively, a mobile loading

device capable of discharging the treated soil mixture into the standard truck-mounted 20-yd³ roll-on/roll-off container.

2.1.4.3.2 Box Unloader—The soil handling system (Box Unloader) shall be capable of unloading boxes (2 × 4 × 8 ft) into the mixer with minimal amount of soil transfers and no contamination exposure to personnel. The contamination control confinement system shall have dust pick-ups capable of tying into the air scavenger system. It is anticipated that confined equipment would need to be used to accomplish this task. There must also be provisions made for the emptying of the soil boxes without allowing the plastic liner to fall into the mixer.

This system shall also be capable of automatically introducing a recipe of cement, fly ash, and other dry additives to the mixer for stabilization of hazardous soil constituents. The bags of dry material may also be loaded into the hopper and conveyed up to the mixer.

2.1.4.3.3 Air Scavenger System—An air scavenger system must provide total elimination of fugitive dust emissions during soil transfer, soil mixing, and soil unloading activities. The mixer enclosure must be sealed or controlled such that fugitive dust does not occur. If possible, a minimum vacuum of 0.10-in. w.g. must be maintained on the soil feed system. Exhaust air shall be filtered with at least a single roughing filter and dual nuclear-grade HEPA filters. Differential pressure gages shall be installed to monitor pressure drop across the pre-filter bank and each HEPA filter bank. The exhaust system is designed to meet the requirements of NFPA 801. The need for a baghouse filtration system upstream of the exhaust filter bank must be evaluated. The air introduced into the HEPA filter banks must be maintained below 90% relative humidity by utilizing duct heaters as necessary.

2.1.4.3.4 Remote Station Process Control Requirements—Due to the radioactive nature of the soil, the treatment system employs remote monitoring/communication/process control. As a minimum, the process control/monitoring system monitors motor temperature, gearbox temperature, motor current draw, and automatic lubrication system temperature and pressure and provides start/stop control and alarms when system operating parameters are out of normal operating range. All process system controls shall be housed in a NEMA 4X enclosure for indoor and housed in NEMA 3R enclosures for outdoor equipment. The remote station control house shall have the following requirements:

- Insulated
- Contain a safety glass window for viewing of the treatment operation
- Air-conditioned/heated
- Wired for lights/receptacles
- Accommodate a personal computer station for data acquisition involving the process
- Located sufficiently far enough away from the treatment system to allow for shielding as necessary.

2.1.4.3.5 Structural Requirements—The structural design for the treatment equipment shall consider the minimum loads listed below. Combinations of these loads shall conform to ASCE 7-98.

- Dead and live: per ASCE 7-98
- Seismic: per UBC-97, Seismic Zone 2B, Soil Profile S D, I = 1.0.

2.1.4.3.6 Electrical Power—All motors are squirrel-cage, induction, energy-efficient, high-power factor type, rated for continuous operation.

Motors are rated 480 V, three (3) phase, 60 Hz duty and recommended for variable speed operation when driven with a variable frequency drive (VFD). Motors also have a horsepower rating of not less than 115% of the brake horsepower required by the mixer when operating at design conditions. All motors shall have a minimum service factor of 1.15.

2.1.4.3.7 Human Factors—The design uses human factor engineering principles and criteria such that all equipment is easily maintainable. The control panel's controls and displays promote rapid operator location of any given component and maximum operator awareness of the treatment system condition. Component arrangement shall promote association of related controls and displays.

The design provides access to each system component for operation, cleaning, and maintenance. It also provides for equipment that is capable of being locked and tagged out during cleaning, maintenance, and repair. Finally, the design provides engineering controls for the mitigation of noise in excess of 85 decibels, time-weighted average (TWA).

2.1.4.3.8 Reliability/Maintainability—The system shall be designed for a 15-year life. Design life considerations extend only to components not expected to require replacement over the life of the installed system under normal operating conditions.

2.1.4.3.9 Debris Treatment Process—As stated previously, hazardous debris, subject to the "Treatment Standards for Hazardous Debris," 40 CFR 268.45) are also processed in the SSSTF and must be processed accordingly. Although soil and debris processing requirements are similar, they are subject to different standards.

Hazardous debris is defined as debris that contains a hazardous waste listed in Subpart D of 40 CFR 261 or that exhibits a characteristic of hazardous waste, as identified in Subpart C of 40 CFR 261. The waste is not debris if a specific treatment standard exists in Subpart D of 40 CFR 268. The following is the definition of debris as extracted from 40 CFR 268.2:

Debris means solid material exceeding 60 mm particle size that is intended for disposal that is: a manufactured object; plant or animal matter; or natural geologic material. However, the following materials are not debris: Any material for which a specific treatment standard is provided in Subpart D, part 268, namely acid batteries, cadmium batteries, and radioactive lead solids; Process residuals such as smelter slag, and residuals from the treatment of waste, wastewater sludges, or air emission residuals; and Intact containers of hazardous waste that are not ruptured and that retain at least 75 % of their original volume. A mixture of debris that has not been treated to the standards provided by 268.45 and other material is subject to regulation as debris if the mixture is comprised primarily of debris, by volume, based on a visual inspection

Cement-based microencapsulation was selected as the primary debris treatment process to be utilized in the SSSTF as described in EDF-1730 in Appendix B-2. This process is a RCRA-approved technology, in accordance with Subpart D of 40 CFR 268.45. Adherence to this requirement is necessary so that the treated debris waste may be disposed in the ICDF landfill.

A flowable grout is required in order to fill debris boxes without removal of the box lids or handling of the debris. Other grout properties that are desirable include

- Low quantities of bleed water as setting occurs
- Low shrinkage to minimize cracks and voids
- Adequate strength to minimize potential for cracks during box handling
- Low unit weight, if feasible, in order to minimize the box weight.

As stated previously, there are two sizes of debris boxes. Preliminary calculations were performed to determine the ability of the boxes to resist the pressures that grouting would impose. A copy of the calculations is attached to EDF-1730 (Appendix B-2). The 2-ft-high boxes are adequate to support the pressure from grouting if the glue bonding the plywood skin to the 2 × 4-ft framing is adequate to resist the grout pressure. The 4-ft-high boxes require bracing during grouting.

All of the treated debris will be disposed of in the ICDF, which is a Subtitle C landfill specifically designed and operated to manage this type of waste.

2.2 Design Standards and Requirements

The following subsections provide the design standards and requirements used for the design and construction procedures for the SSSTF. These include DOE-related codes, standards and documents, engineering standards, and environmental and safety requirements.

2.2.1 DOE-Related Codes and Standards

The following national standards, codes and regulations, subtier standards, code and regulations and site-specific documents are used as the design basis for the SSSTF.

1. 10 CFR 830, Subpart A, 2000, "Quality Assurance Requirements," *Code of Federal Regulations*, Office of the Federal Register, January 2000.
2. ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications," American Society of Mechanical Engineers, 1997.
3. DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*, U.S. Department of Energy Idaho Operations Office, U.S. Department of Energy Idaho Operations Office, U.S. Environmental Protection Agency Region 10, State of Idaho Department of Health and Welfare.
4. DOE-ID, 1999, *Final Record of Decision, Idaho Nuclear Technology and Engineering Center*, DOE/ID-10660, Rev. 0, October 1999.
5. DOE-ID, 2000, *Conceptual Design Report for the Staging, Storage, Stabilization, and Treatment Facility*, DOE/ID-10769, Rev. 0, July 2000.
6. DOE-ID, 2000, *CERCLA Waste Inventory Database Report for the Operable Unit 3-13 Waste Disposal Complex*, DOE/ID-10803, Rev. 0, December 2000.
7. DOE Order 232.1, "Environmental, Safety, and Health Reporting," September 30, 1995.

8. DOE Order 232.1A, "Occurrence Reporting and Processing of Operating Information," August 1, 1997.
9. DOE Order 414.1, "Quality Assurance," November 24, 1998.
10. DOE Order 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees," March 27, 1998.
11. DOE Order 470.1, "Safeguards and Security Programs," September 28, 1995.
12. DOE Order 5480.4, 1993, "Environmental Protection, Safety, and Health Protection Standards," January 7, 1993.
13. EDF-1540, 2000, "SSSTF Waste Inventory Design Basis," Rev. 0, Idaho National Engineering and Environmental Laboratory, January 2001.
14. EDF-1547, 2000, "SSSTF Operational Scenario and Process Flows," Rev. 0, Idaho National Engineering and Environmental Laboratory, January 2001.
15. EPA, 2001, "EPA Requirements for Quality Assurance Project Plans," QA/R-5, EPA/240/B-01/003, U.S. Environmental Protection Agency, March 2001.
16. TFR-17, 2002, "Technical and Functional Requirements, WAG 3 Staging, Storage, Sizing, and Treatment Facility," Rev. 2, Idaho National Engineering and Environmental Laboratory, March, 2002.

2.3 Engineering Standards

The following engineering standards shall apply to the definitive design:

1. DOE-ID, *DOE-ID Architectural Engineering Standards*, Revision 28.
2. Idaho Transportation Department Standard Specifications for Highway Construction (ITD 1983)
3. Manual on Uniform Traffic Control Devices (DOT 1988)
4. Uniform Building Code (UBC 1997)
5. Uniform Plumbing Code (UPC 2000)
6. NFPA Sections 13, 101, 801
7. Idaho Rules for Public Drinking Water Standards (IDAPA 58.01.08)
8. Recommended Standards for Water Works (Published by Great Lakes Upper Mississippi River Board of State Public Health and Environmental Managers, 1997)
9. Recommended Standards for Wastewater Facilities (Published by Great Lakes Upper Mississippi River Board of State Public Health and Environmental Managers, 1997).

2.4 Environmental and Safety Requirements

The TFR-17, developed as part of the design, provided the specific environmental and safety requirements for the SSSTF. These requirements are imposed by the ARARs identified in the OU 3-13 ROD. Appendix A outlines the ARARs and the location of the design/operational requirements within this RD/CWP submittal demonstrating compliance. These ARARs are comprehensive for the SSSTF.

2.5 Management Control Procedures

Title I, II, and III design activities are performed in compliance with the applicable MCPs. The MCPs for this project are those identifying requirements in the following areas:

- Engineering design
- Emergency preparedness and management
- Environmental management
- Fire protection
- Management systems
- Occupational safety and health
- Radiological protection
- Security
- Environmental restoration and waste management
- Conduct of operations
- Quality.

2.6 Status of Record of Decision Assumptions

The bounding assumptions under which the ICDF Complex (including the SSSTF) remedial design and construction activities are performed and the limiting factors and conditions for the ICDF Complex are as follows:

Table 2-1. Status of OU 3-13 ROD assumptions.

Assumption	Status as of March 2002
General Assumptions	
A minimum institutional control period to the year 2095 for land use or access restrictions required to be protective will be implemented at all sites where contaminant concentrations exceeding allowable risk ranges are left in place. The continued need for land use or access restrictions will be evaluated by the Agencies during each 5-year review.	Unchanged. See DOE/ID-10729, <i>Institutional Control Plan for the Idaho Nuclear Technology and Engineering Center, Waste Area Group 3, Operable Unit 3-13</i> (DOE-ID 2001b).
Institutional controls prior to 2095 will consist of site access controls, radiological posting controls, and land use controls as shown in Table 11-1 of the ROD.	Unchanged. See DOE/ID-10729, <i>Institutional Control Plan for the Idaho Nuclear Technology and Engineering Center, Waste Area Group 3, Operable Unit 3-13</i> , Table 3-1 (DOE-ID 2001b).
Completion of the ICDF Complex and approval to begin operations will occur prior to the start of Group 3 soil removal actions at OU 3-13.	Unchanged.
Contaminated soils excavated from OU 3-13 sites and other INEEL CERCLA wastes will be placed in the ICDF if they meet WAC that will be identified in the ICDF RA Work Plan.	Unchanged. Clarification: Waste to be placed in the ICDF for disposal must meet the ICDF Complex WAC (DOE/ID-10881) (Appendix J) and the ICDF Landfill WAC (DOE-ID 2001c).
The overall remedial action objectives (RAOs) for OU 3-13 is to achieve a HI of 1.0 or less and a cumulative increased carcinogenic risk of less than 1×10^{-4} .	Unchanged. The RAOs still apply.
ICDF Complex-Specific Assumptions	
The ICDF Complex will include an engineered facility meeting RCRA Subtitle C, Idaho HWMA, and PCB landfill design and construction requirements. The ICDF will be located within the WAG 3 AOC.	Update. The ICDF Complex also meets DOE Order 435.1 requirements. Compliance strategy for the SSSTF is found in Appendix A to this document.
	The ICDF landfill and evaporation pond ARAR compliance strategy will be found in the ICDF RA Work Plan.
Only INEEL on-Site CERCLA wastes meeting Agency-approved ICDF Complex WAC, to be developed during the remedial design, will be disposed in the ICDF landfill. An important objective of the WAC will be to assure that hazardous substances disposed in the ICDF will not result in exceedances of groundwater quality standards in the underlying drinking water aquifer (the Snake River Plain Aquifer [SRPA]), even if the ICDF leachate collection system were to fail after closure.	Unchanged. The ICDF landfill and evaporation pond WAC are being developed using a modeling approach to ensure that operation of the ICDF Complex will not cause groundwater quality standards to be exceeded in the SRPA. The WAC include the ICDF Complex WAC (DOE/ID-10881) (Appendix J to this document), the WAC for the ICDF landfill (DOE-ID 2001c), and the WAC for the evaporation pond (DOE-ID 2001d).

Table 2-1. (continued).

Assumption	Status as of March 2002
The SSSTF, in accordance with the substantive requirements of IDAPA 58.01.05.008 (40 CFR 264 Subparts DD, I, and J) and IDAPA 58.01.05.006.01 and 58.01.05.006.02 (40 CFR 262.34[a][1]), will consist of a storage/staging building and associated treatment equipment. Operations at the facility will include chemical/physical treatment to prepare ICDF wastes to meet Agency-approved WAC and RCRA LDRs where applicable.	Update. The SSSTF also includes buildings for housing personnel and records retention for ICDF Complex operations. The SSSTF serves as the gatekeeper for the ICDF Complex, and waste inspection and verification occurs at the SSSTF gate.
Site access restrictions and institutional controls will be maintained throughout the postclosure period.	Unchanged. See DOE/ID-10729, <i>Institutional Control Plan for the Idaho Nuclear Technology and Engineering Center, Waste Area Group 3, Operable Unit 3-13</i> , Table 1-3 (DOE-ID 2001b).

2.7 Design Assumptions

The design assumptions under which the SSSTF components are constructed are discussed in the following subsections.

2.7.1 General Site and Utilities

- All utilities are furnished from INTEC, with the exception of power.
- Based on the power requirements of the current design, the existing 12.5-kV line, which runs parallel to Lincoln Blvd. is capable of providing the necessary power.
- Based on the current design, no standby power is supplied to the SSSTF.

2.7.2 Administration Building

- Based on the 10-year design life requirement of the current scope, portable trailers are to be procured.

2.7.3 Decontamination Building

- The decontamination building is capable of decontaminating construction and operation equipment as may be required. The decontamination bay is 30 ft wide by 100 ft long.
- In the event of a fire, the decontamination building is capable of disposing of the fire water that is discharged in accordance with NFPA 801.
- All drain piping and the floor slab in the decontamination building shall be double-contained. Drainage of any leakage goes to the double-contained lift station. Leak detection sensors shall be located at random locations, as may be required to monitor any area where leaks of contaminated water may occur.

2.8 Plans for Minimizing Environmental and Public Impacts

The SSSTF is one portion of the ICDF Complex. The role of the SSSTF is in part to handle the administrative functions for the ICDF Complex. In addition, waste coming into the facility is treated to allow for disposal within the ICDF landfill or evaporation pond. The third function of the SSSTF is to stage, store, and/or repack waste for off-Site disposal.

The SSSTF is built using advanced systems, to allow for the reduction in waste generation. One of the goals is to reduce paper records through the use of electronic databases. Also, energy-efficient lighting is used. All paper is recycled through the INEEL recycling program and any other reusable “equipment” as appropriate. Pollution prevention and waste minimization activities are performed as per the *INEEL Interim Pollution Prevention Plan* (DOE-ID 2000e).

2.9 Quality Assurance

The “Quality Program Plan for the INEEL CERCLA Disposal Facility Complex” (QPP) is included as Appendix K and has been prepared to address all planned SSSTF activities during construction. The current facilities and systems planned for the SSSTF are identified as “low safety consequence.” Consequently, the overall SSSTF process has been given a “Quality Level 3” designation.

The QPP establishes quality assurance requirements for the ICDF Complex. The “Complex” by definition includes the SSSTF and encompasses all activities during the completion of the design, construction, and initial operational testing by the contractor and any subcontractor. The QPP meets the applicable requirements specified in DOE orders; codes, standards, and regulations governing quality programs imposed by the DOE-ID; and the Contractor’s Quality Assurance Program Description. The codes, standards, and regulations that apply to the OU 3-13 project are listed in DOE-ID-10721, *Remedial Design/Remedial Action Scope of Work for Waste Area Group 3, Operable Unit 3-13*, (DOE-ID 2000a). The major quality-assurance-related codes, standards, and regulations are DOE O 414.1A, 10 CFR 830.120, ASME NQA-1, and EPA QA/R-5.

Where applicable, the project design specifications shall identify the quality assurance/quality control (QA/QC) procedures for discrete tasks, consistent with the guidance provided by the Quality Program Plan (QPP) (see Appendix K).

2.10 Identification of Unresolved Data Need

One item requiring additional information prior to final approval has been identified during development of the RD/CWP. This item is the effect of the ICDF landfill and evaporation pond WAC on ICDF operations and is discussed in more detail below.

2.10.1 ICDF Landfill and Evaporation Pond Waste Acceptance Criteria

The draft ICDF landfill and evaporation pond WAC have been submitted as part of the 90% ICDF design. Changes to these documents prior to finalization in 2002 could impact the acceptance and treatment requirements for the SSSTF. Modifications to the SSSTF design or procedures may be necessary to accommodate possible unknown requirements associated with finalization of these WAC.

3. REMEDIAL DESIGN

This section describes the remedial design for the SSSTF, which was developed in accordance with the engineering design basis presented in Section 2.0. The civil design drawings and specifications for the construction activities are included in Appendices C and D, respectively. The remedial design for the general site and utilities, administration building, and decontamination building (including minimum treatment area) are described in the following subsections.

3.1 SSSTF General Site and Utilities

Three sites were investigated during the selection process. The criteria used for selection and the results of the study are documented in EDF-1548, "SSSTF Siting Study." The selected location for the SSSTF is southwest of the INTEC at the INEEL. The facility is sited south of the existing electrical substation No. 2 and the service waste discharge lines to percolation ponds. The south boundary of the SSSTF forms the north boundary of the ICDF landfill, with the landfill extending to the south. Overall site orientation will assist in future expansion of the facility structures, if required. The site is developed to allow for sufficient vehicle parking and circulation. Segregation will be maintained between the light vehicle traffic of the administrative/office area and the heavy traffic of the operational activities related to the decontamination treatment facilities (see project plans for the site layout, Appendix D).

3.1.1 General Site Layout and Design

Topographic surveys have been performed of the site to properly design facilities and to match the existing topographic features. The site is stripped of existing vegetation and then filled and graded for the new buildings, access roads, service areas, and parking lot. Areas to be occupied by the buildings are raised in relationship to surrounding ground elevations to provide drainage away from the building foundations and entrance sidewalks. Grade changes at the main entrance to the administration building are kept to a minimum to permit handicapped personnel and vehicle accessibility. Site surface drainage is coordinated with existing physical structures and future buildings and planned activities of the surrounding area.

Existing INTEC water, sewer, and communication utilities are extended to service the new facility. Potable water is provided for personnel drinking and sanitary uses. Fire water is provided for the building and site fire-extinguishing system. Raw water is supplied to the decontamination facility for the various functions performed there.

Raw water, fire water, power, and communications are extended south from the SSSTF to the north boundary of the ICDF to service facilities there.

Vehicle access includes paved access, exit and service roads, parking areas, and staging areas. The staging area is sized for receiving waste-transport vehicles servicing the decontamination facility.

3.1.1.1 Surface Drainage. The topography in the proposed area for the SSSTF is relatively level. The area is raised in grade with excavated material from the ICDF landfill. The finished surface is sloped a minimum of 1.5% to provide sloped drainage. Surface drainage is diverted to the vacant areas surrounding the buildings, providing drainage away from the facility.

3.1.1.2 Rock Excavation. Excavation of rock is not anticipated for the installation of underground utilities or for the building foundation. This is based on geotechnical investigations performed for the ICDF landfill to the south and the INTEC service waste lines installed on the north of the SSSTF. Rock at construction depth was not encountered. In addition, the SSSTF site improvements are raised 2-6 ft in elevation, eliminating any concerns of encountering rock.

3.1.1.3 Soil Excavation. The site is stripped of existing vegetation and graded in all areas where the building, parking area, and access road are to be installed. The stripped material is salvaged and used to reclaim the area and provide a seed bed for natural vegetation. Soil excavation is required for the installation of underground utilities and the construction of the building foundation. Soil excavation for the foundation is minimal. Excavation activities for the evaporation pond and the ICDF landfill supply the required fill material for the SSSTF.

Space is available for backsloping the majority of all required excavations. Soil compaction is required to meet 95% maximum dry density for all embankments, backfill, subgrade, and base courses under building floor slabs and pavement.

3.1.1.4 Finish Grading. The final finish floor elevation of the administration facility has been designated as 4926. The finish floor of the decontamination building has been set at 4925.

New asphalt concrete access roads are provided, as shown on the Site Plan, for the new facility (see the project plans for details). Asphalt paving is also provided to facilitate personnel parking and delivery vehicles. The SSSTF site grading has been designed to accommodate at minimum a 1.5% grade, so that storm water drains away from the facilities.

Reinforced-concrete sidewalks, door stoops, and approaches are provided to facilitate personnel access to the facility. Provisions for the safe entry to the administration facility by handicapped individuals are provided. Guard posts are provided as required for protection from service vehicle activity. Building utility and equipment slabs are also reinforced concrete and sized appropriately.

3.1.1.5 Landscaping. The feasibility of landscaping areas immediately adjacent to and surrounding the administrative areas should be considered. Adjacent areas not paved but disturbed during construction are seeded with dryland grass compatible with seed mixtures developed for the INEEL.

3.1.1.6 Underground Utilities. The utilities for the SSSTF are supplied from existing services within the INTEC plant. Coordination is required between the INTEC landlord, security personnel, and communication personnel when excavation for the utilities occurs within the INTEC security zone and across the perimeter security fence.

A new 2-in. pressure sanitary sewer line is routed from the new facility, via two grinder pumps, to an existing sanitary sewer manhole in the INTEC wastewater collection system. The pumps run alternately, so that both pumps are exercised on a regular basis and provide redundancy. A pipe connection is located immediately outside the lift station. This makes it possible to pump from the lift station with a portable pump in the event there is a power failure (see Appendix B-3, EDF-1937).

Potable water is supplied to the SSSTF by tying into an existing INTEC potable water line. All potable water lines are buried a minimum depth of 6 ft below grade. There is a 10-ft clear zone minimum between the potable water and the sanitary sewer (see Appendix B-4, EDF-2655).

A new 6-in. raw water line and a new 12-in. firewater line are provided to the SSSTF by connecting into the existing INTEC raw water and fire water systems. Fire water service to individual hydrants or fixtures is provided by an 8-in. pipe (see Appendix B-4, EDF-2655, and Appendix B-5, EDF-1948).

Utilities routed from inside the INTEC have an impact on Environmentally Controlled Area (ECA) CPP-88. Excavation within the INTEC plant complies with the regulations governing excavation in an ECA.

Power for the SSSTF comes from a 12.5-kV power line that runs parallel to Lincoln Blvd. This power is transmitted on an overhead power line to the administration building. From this point, the power feed is underground in a red concrete duct bank to the decontamination building and supporting facilities and to the large equipment head bolt heaters on the south boundary of the SSSTF.

3.1.2 Major Equipment Description

The major equipment associated with the general site and utilities are the lift station pumps. Two 2-hp grinder pumps in a lift station for the sanitary sewer are required. Two additional 2-hp grinder pumps are installed in the lift station at the decontamination facility to pump decontamination water from the decontamination building and storm water from the contaminated equipment storage pad and scales to the evaporation pond. An additional 2-hp pump serves as a standby pump to be used for maintenance and emergencies.

3.2 Administrative Facility

The administrative functions in the administration facility are weighing and verifying waste coming into or out of the facility, determining waste disposition, administering treatment verification and other quality activities, processing and maintaining required records associated with the waste disposition, and performing overall management functions.

Also included, as part of the administrative facility, is the scale. A load weighing scale is located adjacent to the administration building site. This scale is used to weigh waste transport vehicles entering and leaving the SSSTF. The scale is expected to accommodate standard commercial tractor-trailer units and has a capacity of 60 tons with an accuracy of within 0.1% at full scale.

3.2.1 Administration Building

The administration building consists of transportable office trailers. These trailers house office space, a public use area with kitchenette, document storage room, restrooms, and utility rooms. The trailers come in two units, and combined, provide an area of 1,960 ft² (28 ft × 70 ft).

3.2.1.1 Administrative Office Area. An office area accommodates the administrative activities of a limited number of office personnel. Space is provided for office machines and supplies. Square footage for the allowed office areas follows the General Services Administration (GSA) standards.

3.2.1.2 Public Use Area. A commons area provides space for administrative and operational personnel interface. The common area serves as a conference room, a training room to conduct classroom training, a break room, and as an area for conducting planning functions.

3.2.1.3 Document Storage Room. Physical storage is not provided in this facility. Required document storage is accomplished through transfer of information to a remote-server backup system located within the INTEC site.

3.2.1.4 Public/Office Restrooms Area. Accessible restrooms are provided. The number of fixtures meets the minimum required in accordance with the UBC and UPC. A janitors closet with a mop sink and storage space is also provided.

3.2.1.5 Utility Rooms. Separate rooms are provided for the service utility and equipment supporting the facility, such as, heating and air conditioning equipment, fire riser, electrical panels, and communication equipment. The individual rooms are sized as needed to support the equipment required for each utility.

3.2.1.6 Structural. The administrative facility is two units moved on trailers. The trailers are supported on cast-in-place concrete piers. A ramp and stairs provide access to the facility.

3.2.1.7 HVAC. The HVAC for the administration building is to be for personnel comfort with the design criteria per the *DOE-ID Architectural Engineering Standards* (DOE-ID 2001a) and ASHRAE 62-99 (for the fresh air supply).

3.2.1.8 Utilities. Potable water and sanitary sewer are supplied from existing services within the INTEC plant. Hot and cold water is available.

3.2.2 Load Weighing Scale

The load weighing scale is located immediately south of the administration building. All waste shipments coming into the SSSTF are weighed and documented at this location. Tare weights of out-going vehicles are also obtained. The weigh data are electronically recorded into the waste database in the administration building. The scales have a capacity of 60 tons and an accuracy within 0.1% at full scale.

3.2.3 Major Equipment Description

The major equipment associated with the SSSTF administration facility is the ICDF Complex waste tracking system and the fire alarm system. Both of these systems are described in the following subsections.

3.2.3.1 ICDF Complex Waste Tracking System. As waste is processed through the SSSTF and into the landfill, a waste tracking system is necessary. This tracking system serves several purposes. It permits the waste generating site personnel to submit a request to send waste to the ICDF. As part of this request, the generating site personnel submit the Waste Approval Form. From the Waste Approval Form, a determination is made as to whether the waste meets the WAC for the ICDF Complex. Once the determination is made that the waste meets the criteria, the waste units can be assigned an identification (ID). This is in the form of a barcode and associated ID number that is printed for tracking and disposition processes. The ID follows the waste unit through the SSSTF and into the landfill, evaporation pond, storage, or off-Site disposal. The waste may go directly to the landfill or evaporation pond or may be processed through the stabilization process or sent off-Site. As the waste travels through the ICDF Complex, a log is recorded of actions taken in the processing of the waste. Finally, location coordinates of the waste in the landfill are entered into the ICDF Complex database. The waste tracking system will be discussed in the ICDF Complex RA WP.

3.2.3.2 Fire Alarm System. There is a fire alarm system installed in the administration and decontamination buildings that utilizes a fire alarm control panel located at the entrance to each building. Input signals from initiation device circuits to the fire-alarm control panel are from manual fire alarm stations located at each of the building exits. A fire-sprinkler system water-flow signal is located at the fire sprinkler system riser in the decontamination building only. There is a supervisory signal from the fire sprinkler system-control valve indicating if the valve is open or closed. Output signals to the occupant notification appliance circuits are provided for each of the input fire-alarm signals. The occupant notification appliances are a combination horn (standard fire alarm signal) and flashing strobe, which are compliant with the Americans with Disabilities Act (ADA). The fire alarm output signals will be transmitted to the INEEL Proprietary Fire Alarm System over telephone circuits and by means of a digital alarm communications transmitter. All alarm signals will be received at CFA 681 by a digital alarm communications receiver and retransmitted through the INEEL Proprietary Fire Alarm system to the Fire Department Dispatcher.

3.3 Decontamination Facility

The decontamination facility is an engineered metal building to be located near the ICDF landfill for the decontamination of trucks and equipment. The building is qualified under the UBC Type IIN construction (Type IIN construction stipulates noncombustible materials). A portion of this building also houses the minimal treatment equipment. A high-pressure water sprayer is used to wash containers, when necessary. After decontamination, the containers are stored at the empty container storage pad until they are required or are returned to the waste generating site. Equipment and trucks are washed to eliminate any external radiological contamination prior to leaving the ICDF Complex, as necessary. Decontamination washwater drains to a lift station located adjacent to the decontamination building and is pumped directly to the evaporation pond. Any equipment that has not been decontaminated and is no longer in use is stored on a contaminated equipment storage pad to be constructed west of and adjacent to the decontamination building. A TSCA-compliant PCB storage container will be located on the south side of the contaminated equipment storage pad.

3.3.1 Decontamination Building

The decontamination building is divided into three main sections:

- One-half of the building consists of a decontamination bay. This is where transport vehicles, waste containers, and other equipment can be washed and cleaned of any contamination.
- Approximately 1/4 of the building has been designated as a treatment area. When it is required, this area is used to treat contaminated debris, soil, and aqueous waste that do not meet either the ICDF landfill WAC or the ICDF evaporation pond WAC.
- A portion of the treatment area is set aside for storage of PCB-contaminated waste. This waste is stored in a TSCA-compliant unit that includes a 6-in. curb.
- The third area consists of a mechanical room, fire riser room, electrical room, personal protective equipment (PPE) change room, a radiological controls equipment room, and men's and women's restrooms with showers. These rooms support the function of the decontamination and treatment portions of the building (see project plans for the layout and details of these rooms and facilities). The ceiling of the fire riser and electrical rooms consists of a precast, hollow-core panels designed to support the HVAC equipment for building. The voids in the slab are to reduce the dead load of the slab.

The floor slabs in the decontamination building pad are post-tensioned with high-strength cables to attenuate shrinkage and cracking. In addition, water stops are in place to satisfy the containment requirements. The building slabs are also coated with a high-grade epoxy coating.

3.3.1.1 Secondary Containment and Leak Detection. The decontamination building has been classified as a containment building under 40 CFR 264.1100. This regulation states that a “containment building used to manage hazardous waste containing free liquids or treated with free liquids must be designed with secondary containment features to prevent contamination of subsurface soils.” To meet this requirement, a secondary containment system employing a high-density polyethylene (HDPE) liner system has been designed for use under the concrete floors in the building. Any leakage of water through the concrete pad is drained through this secondary containment system to the secondary-containment piping system. Through the piping, the water flows to the secondary containment of the lift station. Sensors are placed in the lift station to monitor any leaking that may occur.

3.3.1.2 P-trap. A concrete P-trap is constructed inside the treatment area. The details are shown in the construction drawings. The intent of the P-trap is to provide a water block separating the outside air from the air inside the decontamination building. A negative pressure must be maintained in the building to control contaminated dust. The P-trap prevents the outside air from entering the building and equalizing the internal air pressure.

3.3.2 Contaminated Equipment Storage Pad

The contaminated equipment storage pad is an approximately 7,400-ft² concrete pad (72.66 × 102.5 ft). It is a 6-in.-thick slab, post-tensioned with high-strength cables to attenuate shrinkage and cracking. Additionally, the slab is also coated with a waterproof seal. Curbs are placed around the pad and it is sloped to drain into an 80-ft-long trench drain that collects and transports all runoff water to the lift station.

While the piping from the contaminated equipment storage pad is double-contained, there is no double containment or leak detection under the slab. This is in accordance with 40 CFR 264.175 (c). This regulation states that “storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system...provided that (1) the storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or (2) the containers are elevated or otherwise protected from contact with accumulated liquid” (see Appendix B-6, EDF-2648). Wastes containing F021, F022, F023, F026, or F027 codes will not be stored on this pad.

3.3.3 PCB Storage Container

A TSCA-compliant PCB storage container will be located at the ICDF Complex on the south side of the contaminated equipment storage pad (Figure 1-3). This container will be a fully enclosed portable unit with a steel roof and walls. The footprint of the container is approximately 8 ft × 18 ft with a usable storage area of approximately 144 ft² with a drum storage capacity of thirty-six 55-gal drums. It will have a built-in spill containment sump, 7.5 in. deep with a storage volume of 650 gal. The maximum floor loading will be 300 lb/ft². The container will have interior lighting, heating, and loading ramps that will be connected following placement. A design drawing with the specifications for the proposed PCB storage container is provided in Figure 3-1.

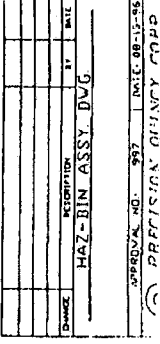
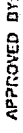
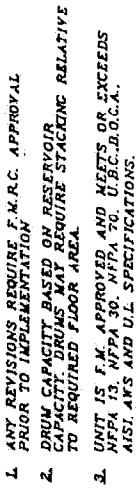
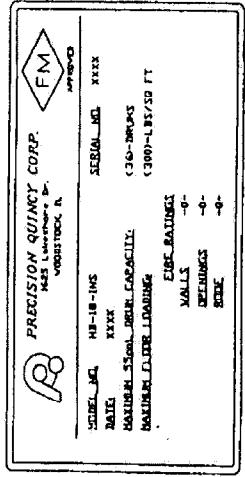
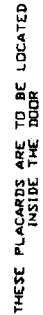
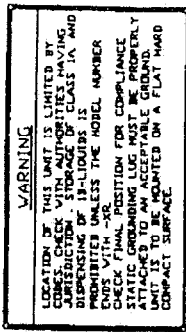
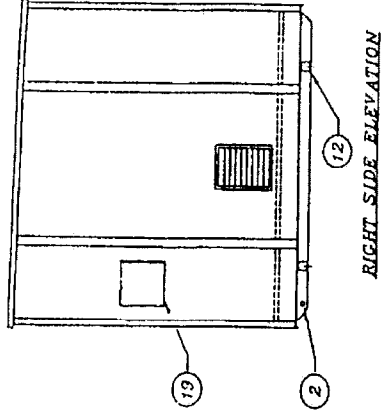
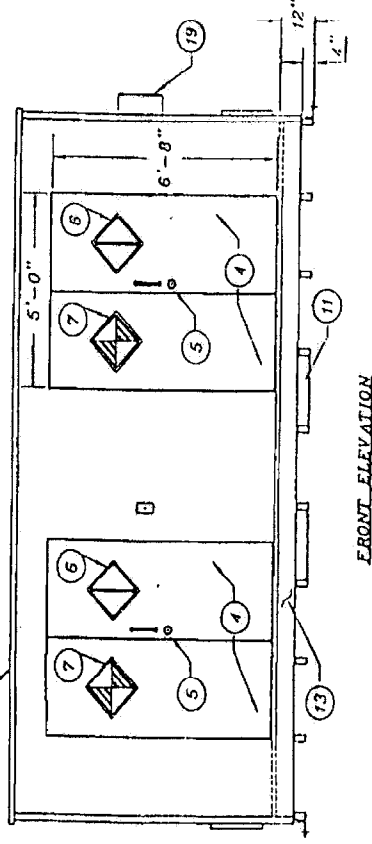
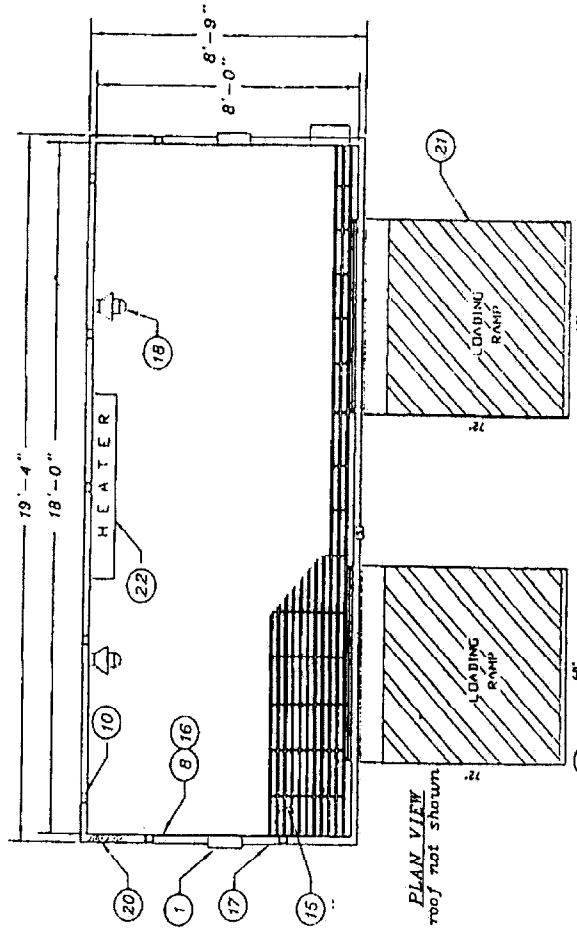
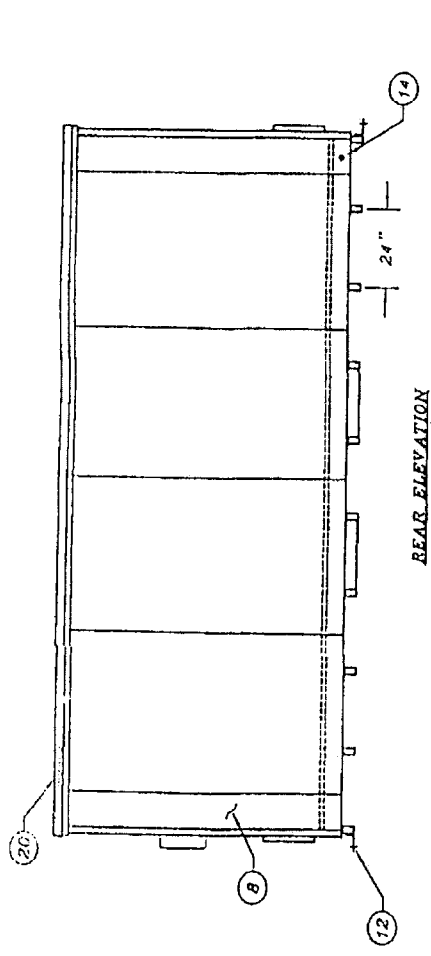
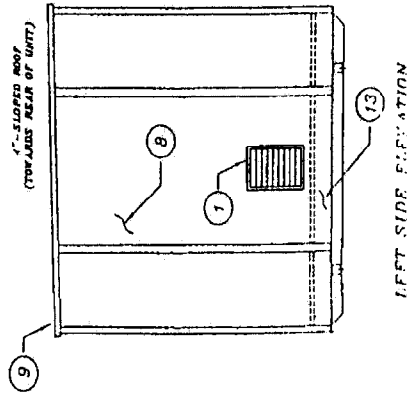
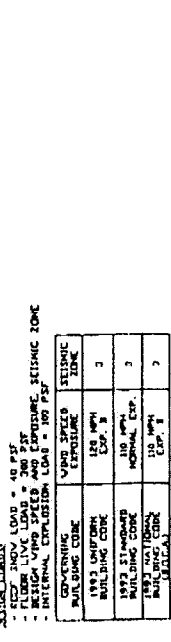
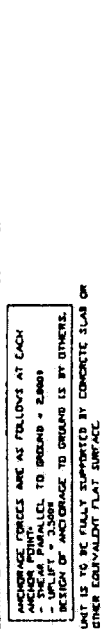
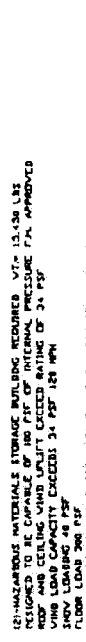
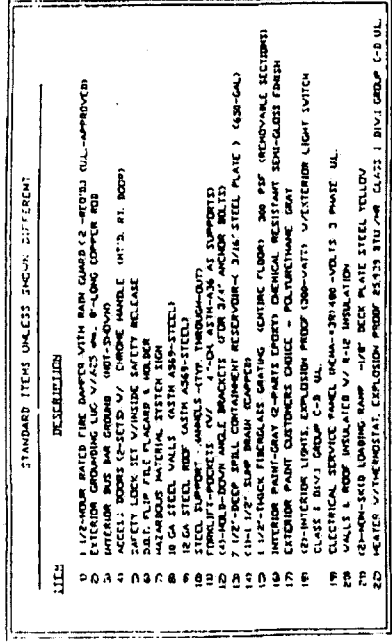


Figure 3-1. PCB storage unit.

3.3.4 Drainage of Contaminated Water

To comply with the ARARs, all drain piping from both the decontamination building and contaminated equipment-storage pad is double-contained. Drain water and storm water on the contaminated equipment pad are collected in a trench drain. This trench drain directs the water to a 12-in. HDPE drain pipe encased in 18-in. HDPE pipe. The drainage is directed into the decontamination building, under the floor, through the P-trap, under two floor drains, to collect drainage from the decontamination and treatment rooms of the decontamination building. At this point, the 12-in. pipe is reduced to a 6-in. HDPE pipe. The 6-in. pipe is encased in an 10-in. HDPE pipe. The drain water flows from the 6-in. pipe through an oil/water separator, then into a lift station. The drain water is then pumped through a 2-in. pressure pipe from the lift station to the evaporation pond for disposal. The 2-in. pipe is encased in a 4-in. HDPE pipe (see Appendix B-6, EDF-2648).

3.3.5 Oil/Water Separator

All drain water from the contaminated equipment storage pad and the decontamination building drains through an oil/water separator. The oil/water separator allows the collection of petroleum products. In addition, soil particles can be allowed to settle out in the separator. Additionally, the oil/water separator is designed to provide a water block to separate the outside air from the air inside the decontamination building similar to the P-trap. A separate vent will be provided from the oil/water separator to the surface for ventilation. The piping from the drain trenches in the building and storage pad is also designed so that the bulk of sedimentation is collected in the trenches and removed from there.

3.3.6 Lift Station

The lift station is used to pump contaminated water from the decontamination building to the evaporation pond. It is designed with an inner 4-ft-diameter fiberglass shell. Two 2-hp submersible grinder pumps are located in this shell and are configured to operate alternately. The two pumps provide redundancy and extend the life of both pumps. Slide rails are placed inside the shell where the pumps can be removed from the outside surface and maintenance personnel do not have to enter the lift station housing.

The lift station shell is placed inside a 6-ft-diameter concrete vault to be used as the secondary containment system. Any leakage inside the building or collection piping drains into this vault where detectors monitor the leakage. In the event of leakage, corrective action can be taken to drain the leakage from the concrete vault.

The lift station also receives any storm drainage that may accumulate in the scale pit. The piping from the scale pit is double-contained, but no double containment is provided around the pit itself (see Appendix B-6, EDF-2648).

3.3.7 Minimum Waste Treatment

The SSSTF provides minimum treatment capabilities to treat small volumes of waste and secondary waste streams generated during ICDF Complex operations. In addition, the minimum treatment system has the capability of treating small volumes of aqueous liquids/sludges with chemical and radiological constituents similar to those of the soil wastes.

Details related to minimum waste treatment of soils is described in EDF-ER-296, "Process and Treatment Overview for the Minimum Treatment Process," provided in Appendix B-1. An EDF specifically developed for selecting a debris treatment technology, EDF-1730, "SSSTF Debris Treatment Process Selection and Design," is provided in Appendix B-2. A brief overview of these treatment processes is provided below.

3.3.7.1 Soils Waste Treatment Process. Only soils associated with Sites CPP-92, CPP-98, CPP-99, and CFA-04 are being considered for treatment as part of the SSSTF RD/CWP. This results in approximately 2,060 yd³ of soil that may potentially require treatment. The soil waste from Sites CPP-92, -98 and -99 is packaged in approximately 620 plastic-lined wooden boxes measuring either 2 × 4 × 8 ft or 4 × 4 × 8 ft. The 800 yd³ of soil waste from CFA-04 has not been excavated and plans regarding this remedial action have not been finalized. The treatment process consists of a cement-based stabilization process for the soils contaminated with heavy metals. Using Portland cement, or similar hydraulic binders, is an accepted technology for rendering the soils nonhazardous. The hydraulic binders do this by reducing the leachability of the contaminant metals to acceptable levels. The main ingredients may consist of Portland cement, flyash, granulated blast furnace slag, chemical reagents, chemical plasticizers, and water.

A treatability study approach for developing recipes of the main ingredients to ensure treatment of the soils will be presented in the "Treatability Study Test Plan for Soil Stabilization at the SSSTF Using Portland Cement-Based Reagents" to be provided in the ICDF Complex RA Work Plan. This treatability plan uses actual waste samples at various waste loadings to determine when the appropriate treatment level has been attained. Performance of the recipe on the waste sample is based upon TCLP testing and the paint filter test, as necessary, to meet the ICDF Complex WAC. The recipe provided in the treatability plan is intended to provide a dry, non-slab final waste product that is similar in physical character to the original soil. Other recipes and/or reagent types may be used to improve the performance as long as the test objectives are met. While the Portland cement-based system is the baseline chemical fixation and stabilization formulation, other systems that can be shown to meet the objectives may be substituted.

As stated previously, treatment is to occur in the designated area of the decontamination building. The process consists of the following steps:

- The waste soil is transferred from plastic-lined wooden boxes or other approved containers to a mixing vessel, while maintaining minimum dust release (contamination) to the adjoining area.
- In the mixer, the soil is combined with a hydraulic binder (Portland cement or Portland cement blend) and possibly a small amount of chemical reagents and admixtures. A minimum amount of water is also added; ideally, a relatively dry, crumbly, or friable waste/cement mixture is obtained. A high-intensity or high-efficiency mixer is desirable to ensure thorough mixing of the soil with the other ingredients. Additionally, the mixer should be able to accept a significant variation in soil particle/rubble size as segregation or screening of the waste is not anticipated.
- After mixing is complete, the soil/cement must be transferred (with minimal dust release) into a container and staged where curing is completed.

Most wastes targeted under the minimum treatment option are packaged in a similar manner; therefore, a single and potentially simple and inexpensive way of transferring and treating these wastes may be possible. An initial list of operational constraints and requirements was presented and made available to commercial vendors through the Request for Qualifications and Interest process to determine the levels of interest, sophistication, and cost associated with a treatment unit. Various vendors have expressed levels of interest, and a procurement specification has been developed describing the treatment

system criteria, requirements, and constraints for treating the waste to meet the ICDF WAC. This procurement specification is included as an appendix to EDF-ER-296 (Appendix B-1). Upon approval of the procurement specification, it is sent to the prospective vendors whereupon the treatment unit is procured and installed in the decontamination facility.

3.3.7.2 Debris Treatment Process. Another of the processes to occur in the decontamination building is treatment of “hazardous or mixed debris” which is one of the CERCLA cleanup activities identified in the OU 3-13 ROD. Hazardous debris is defined as debris that contains a hazardous waste listed in Subpart D of 40 CFR Part 261 or that exhibits a characteristic of hazardous waste, as identified in Subpart C of 40 CFR Part 261. The waste is not debris if a specific treatment standard exists in Subpart D of 40 CFR 268. The following is the definition of debris as extracted from 40 CFR 268.2.

Debris means solid material exceeding 60 mm particle size that is intended for disposal that is: A manufactured object; plant or animal matter; or natural geologic material. However, the following materials are not debris: Any material for which a specific treatment standard is provided in Subpart D, part 268, namely acid batteries, cadmium batteries, and radioactive lead solids; Process residuals such as smelter slag, and residuals from the treatment of waste, wastewater sludges, or air emission residuals; and Intact containers of hazardous waste that are not ruptured and that retain at least 75 % of their original volume, A mixture of debris that has not been treated to the standards provided by 268.45 and other material as subject to regulation as debris if the mixture is comprised primarily of debris, by volume, based on a visual inspection.

The waste is not debris if a specific treatment standard exists in Subpart D of 40 CFR Part 268. Because obtaining a representative sample of debris is a major problem, EPA established alternative treatment standards for debris based on the use of required technologies.

A review of the candidate waste streams for debris treatment revealed a total of 562 yd³ of debris that may require treatment. Some boxed wastes in the SSA (CPP-92, CPP-98, and CPP-99) were identified as the primary debris-containing waste streams, in addition to smaller quantities from TSF-07 and D&D&D waste.

Several debris treatment technologies were identified in accordance with the Alternative Treatment Standards for Debris (see table in 40 CFR 268.45). These technologies considered were from three general categories: extraction, destruction, and immobilization. The technologies were pre-screened and further analyzed against evaluation criteria, including quality control, operations, cost, implementability, inherent safety, and flexibility. Based on the analysis performed, cement-based microencapsulation was selected as the primary debris treatment process to be utilized in the SSSTF. Microencapsulation is the easiest to perform, least expensive, easily meets the performance standard, and is the safest with the least amount of worker exposure to the hazardous and radioactive contaminants. The selection process is described in EDF-1730 provided in Appendix B-2.

The performance specification for microencapsulation is to reduce the leachability of the hazardous contaminants on the debris. This treatment process is performed in a nonintrusive, nonlabor-intensive manner to reduce exposure potential to those workers conducting the treatment and is expected to consist of the following steps:

- The box containing the hazardous debris would be placed in the working area.
- Two holes would be cut into each end on the top of the box with a hole saw. The operator ensures that the holes breach the plastic liner on the inside of the box.

- A flowing cement grout is injected into one of the holes until the grout rises and begins to come out of the other hole.
- The cement grout would then be allowed to cure. Once cured, a forklift would place the box on a flat bed truck where it would be transported to the ICDF for placement.

Additional details describing the proposed cement grout recipes planned for microencapsulating the debris, and the conceptual design for bracing the debris boxes during treatment, are given in “SSSTF Debris Treatment Process Selection and Design,” provided in Appendix B-2.

3.3.7.3 Major Treatment Equipment Description. The minimum treatment process includes the following major equipment components or facility areas:

- Raw material unloading station
- Storage for reagents (c.g., Portland cement, blast furnace slag, flyash)
- Dry and liquid additive tanks
- Waste water tank(s) and piping
- Waste container unloading station
- Blender/mixer unit
- Container fill station
- Stabilized material containers
- Container staging station
- Treated soil sample station
- Treated soil sample transfer station
- Process confinement providing for dust suppression system(s), and a physical structure utilized in conjunction with filtered ventilation air
- Decontamination and washing systems
- Process interfaces for waste form packaging/loading
- Associated process material transfer equipment.

Further definition of this equipment will be provided following procurement of the actual treatment process unit as described in Appendix B-1.

4. CONSTRUCTION WORK PLAN

This section describes the management approach to performing construction of the SSSTF, the work elements, the associated schedule, and the documentation required for construction and to document completion. As the remedial design and the construction work plans are combined into one RD/CWP for this project, some details of the implementation have already been described in the design sections of this document.

4.1 Relevant Changes to the RD/RA SOW

The only two significant changes to the RD/RA SOW for WAG 3, OU 3-13 (DOE-ID 2000a) are reducing the work scope of the SSSTF and splitting the RA component into a separate document for the entire ICDF Complex. As discussed previously, the SSSTF activities described herein include the utilities and minimum infrastructure needed to support the ICDF landfill and evaporation pond construction and direct disposal operations. In addition, limited treatment capabilities are available to treat small volumes of waste and secondary waste streams generated during SSSTF and ICDF operations. These design activities are currently well defined and, consequently, represent low risk for significant future revisions to design if implemented during the construction phase of the ICDF landfill.

Further investigation of known or potential waste streams has not resulted in the need for a larger treatment facility than is currently planned in this RD/CWP. If, in the future, the need for a large or additional type of treatment is identified, scoping would be initiated along with the subsequent development of FFA/CO design and operational documents. If the additional treatment capacity or type is identified, a modification to the OU 3-13 RD/RA SOW will be developed and submitted to the Agencies for incorporation.

4.2 Subcontracting Plan

The advent of ICDF Complex subcontracting represents the merging of SSSTF and ICDF into a collective project implementation and execution plan. It is intended that the SSSTF construction work be competitively bid as a firm fixed price contract. The INEEL procurement process is followed and includes issuance of a Request for Proposal (RFP), pre-bid conference, bid evaluation, notice of award, notice to proceed, vendor data submittals, and a pre-construction kickoff meeting.

If funding availability becomes an issue, the Agencies will be notified and the construction of ICDF Complex facility components may be scheduled for staged implementation with all components related to direct disposal having the highest priority.

4.3 Construction Work Elements

The following sections identify the work elements required to implement and complete the SSSTF construction. Additional detail can be found in the project design drawings, technical specifications, and procurement specifications.

4.3.1 Premobilization

Requirements for vendor data submittals, training, and medical information specified by the design specifications and INEEL-specific requirements are provided in the RFP. The subcontractor provides all required documentation, bonds, insurance, and proof that all required training and medical examinations are complete as per the construction health and safety plan (HASp) (see Appendix G) before the subcontractor is allowed to mobilize. These submittals certify that the subcontractor can meet and satisfy the requirements of the RFP and the project.

4.3.2 Mobilization

Mobilization is the work performed by the subcontractor in preparation for construction activities. This work generally implements the project- and site-required administrative, engineering, and health and safety controls. Mobilization includes such activities as set-up of subcontractor site offices; demarcation of parking areas, equipment and material laydown areas, and work zones; and installation of signs, postings, and fences. The SSSTF activities are performed outside INTEC facility fence. On a case-by case basis, coordination of these activities with those occurring within the INTEC facility fence may be required between contractor, subcontractor, and facility personnel to ensure that these activities have minimal impact on INTEC operations.

4.3.3 Clearing and Grubbing the Sites

The subcontractor clears the work sites of vegetation and/or debris as required, in accordance with the project specifications (Appendix C). The subcontractor confines clearing and grubbing activities to those areas required for barrier construction, roadwork, and SSSTF construction. Disturbance of underlying soils is minimized during performance of these activities, and any areas outside the designated areas that are damaged or disturbed by the subcontractor's activities are repaired and reseeded, if necessary, by the subcontractor, in accordance with the appropriate specifications (Appendix C).

4.3.4 General Site and Utilities

Construction of the SSSTF general site and utility ties are performed as part of this ICDF Complex remedial action and implementation . The specific work elements for this task include

- Filling and grading the site for the new buildings, access roads, service areas, and parking lot.
- Raising the areas to be occupied by the buildings in relationship to surrounding ground elevations to provide drainage away from the building foundations and entrance sidewalks. Grade changes at the main entrance to the administration building are kept to a minimum to permit handicapped personnel and vehicle accessibility.
- Bringing in the existing INTEC fire water, potable water, raw water, sewer, and communication utilities to service the new facility.
- Extending the raw water, fire water, power, and communications south from the SSSTF to the north boundary of the ICDF to service facilities there.
- Providing power to the SSSTF and ICDF from the lines on Lincoln Blvd.

4.3.5 Administrative Facilities

The administrative facilities consist of transportable office trailers and a scale for weighing waste transport vehicles entering and leaving the ICDF Complex. These office trailers house office space, a public use area with kitchenette, document storage room, restrooms, and utility rooms. The trailers come in two units and, combined, they provide an area of 1,960 ft² (28 × 70 ft).

The load weighing scale is located immediately south of the administration building. The scales have a capacity of 60 tons and an accuracy within 0.1% at full scale.

4.3.6 Decontamination Facilities

The decontamination facilities consist of the decontamination building, contaminated equipment storage pad, associated piping and leak detection system, oil/water separator, and the lift station. The specific work elements for constructing these facilities are discussed in the remainder of this section.

4.3.6.1 Decontamination Building. The decontamination building is divided into three main sections:

- One-half of the building consists of a decontamination bay. This area is approximately 3,100 ft² (30.25 × 102.5 ft). The floor is a concrete slab post-tensioned with high-strength cables to attenuate shrinkage and cracking. Additionally, the slab is also coated with a waterproof seal and is sloped to drain into collection trench in the middle of the bay that collects and transports all runoff water to the lift station.
- Approximately 1/4 of the building has been designated as a treatment area. The slab under this area is post-tensioned and sloped to drain into a 4-ft-square trench. This floor is also coated with a waterproof seal.
- The third area consists of a mechanical room, fire riser room, electrical room, PPE change room, a RadCon equipment room, and men's and women's change rooms with showers. The ceiling of the fire riser and electrical rooms consists of a precast, voided slab designed to support the HVAC equipment for building. The voids in the slab are to reduce the dead load of the slab.

4.3.6.2 Minimum Treatment System. The minimum treatment system is located within the treatment area as designated previously. For the debris treatment process, no significant construction activities are foreseen. Treatment of debris will be described in detail in the O&M Plan to be submitted in the ICDF Complex RA Work Plan. The minimum treatment system for soils is a premanufactured system that is procured and installed per the procurement specification in EDF-ER-296 (Appendix B-1). This specification details the requirements for purchasing and installing this system.

The specification covers the supplier requirements for the design, assembly, installation, testing, and training for the treatment system. It is not the intent of the specification to completely define all details of installation. Equipment is designed, assembled, and installed in accordance with the specification and the supplier's standard practices when such practices do not conflict with the specification.

Following procurement, the treatment system is delivered and completely assembled at the decontamination facility by the supplier. Peripheral equipment is generally not included. The following items are not included in the scope of work of the supplier:

- Connection of the supplier's equipment to the decontamination building tie-ins. However, the supplier's service engineer works with the contractor to assure a complete and functional system.
- Radiation monitoring and any required shielding is furnished and installed by the contractor.
- The design, fabrication, and installation of the liquid/sludge waste injection system are the responsibility of the Contractor. Only the multi-port injection connections on the mixer are included in the supplier's scope of work.

Following installation, the supplier is also responsible for conducting system operability testing and training the ICDF Complex operations personnel in the use of the treatment system.

4.3.6.3 Secondary Containment and Leak Detection. The leak detection system under the decontamination and treatment pad in the decontamination building is constructed by first preparing the subgrade to provide a good foundation with no sharp or protruding rocks evident. Then an 8-oz nonwoven geotextile will be installed to protect the liner from the subbase material. Following the geotextile installation, a 40-mil HDPE liner is installed. A geonet is placed on the liner as the drainage layer. The geonet is lined on both sides with a filter fabric. A 6-in. layer of sand is placed on the filter fabric upon which the concrete slabs rest. All piping from the decontamination building and contaminated equipment storage to the lift station are double-lined. Sensors are placed in the lift station to monitor any leaking that may occur.

4.3.6.4 P-trap. A concrete P-trap is constructed inside the treatment area. The intent of the P-trap is to provide a water block separating the outside air from the air inside the decontamination building to maintain negative pressure in the building to control contaminated dust.

4.3.6.5 Contaminated Equipment Storage Pad. The contaminated equipment storage pad is an approximately 7,400-ft² concrete pad (72.66 × 102.5 ft). It is a 6-in.-thick slab, post-tensioned with high-strength cables to attenuate shrinkage and cracking. Additionally, the slab is also coated with a waterproof seal. Curbs are placed around the pad and it is sloped to drain into an 80-ft-long trench drain that collects and transports all runoff water to the lift station.

4.3.6.6 Drainage of Contaminated Water. To comply with the ARARs, all drain piping from both the decontamination building and contaminated equipment storage pad is double-contained. Drain water and storm water on the contaminated equipment pad are collected in a trench drain. This trench drain directs the water to a 12-in. HDPE drain pipe encased in an 18-in. HDPE pipe. The drainage is directed into the decontamination building, under the floor, through the P-trap under two floor drains to collect drainage from the decontamination and treatment rooms of the decontamination building. At this point the 12-in. pipe is reduced to a 6-in. HDPE pipe. The 6-in. pipe is encased in a 10-in. HDPE pipe. The drain water flows from the 6-in. pipe through an oil/water separator, then into a lift station. The drain water is then pumped through a 2-in. pressure pipe from the lift station to the evaporation pond for disposal. The 2-in. pipe is encased in a 4-in. HDPE pipe.

4.3.6.7 Oil/Water Separator. All drain water from the contaminated equipment storage pad and the decontamination building drains through an oil/water separator. The oil/water separator is a concrete vault with a baffle that allows the collection of petroleum products. In addition soil particles can be allowed to settle out in the separator. The piping from the drain trenches in the building and storage pad are also designed so that the bulk of sedimentation is collected in the trenches and removed from there.

4.3.6.8 Lift Station. The lift station is constructed to pump water from the decontamination building, contaminated equipment storage pad, and scales to the evaporation pond. It consists of an inner 4-ft-diameter fiberglass shell placed inside of a 6-ft-diameter concrete vault to be used as the secondary containment system. Two 2-hp submersible grinder pumps are placed inside the lift station. They are configured to operate alternately to provide redundancy and extend the life of both pumps. Slide rails are placed inside the inner shell where the pumps can be removed from the outside surface and maintenance personnel do not have to enter the lift station housing. Leak detection monitors are placed inside the secondary containment vault at strategic locations to check for leaks in the system.

4.3.7 Stormwater Management and Sediment Control

The subcontractor is required to read, sign, accept, and comply with the SWPPP-CA developed for this project. The SWPPP-CA has been developed for construction and installation of the utilities to the ICDF Complex and for construction of the SSSTF minimum infrastructure. The SWPPP-CA is found in Appendix I of this plan. It outlines the measures the subcontractor must follow in order to be in compliance with INEEL rules and regulations regarding control of stormwater and associated sediment.

4.3.8 Dust Control

Precautions such as water spray, wind monitoring, and/or visual observation are used during any earthmoving activities to prevent the generation of fugitive dust. Air monitoring may be performed at the discretion of the industrial hygienist based on their evaluation of the effectiveness of the dust suppression measures to control fugitive dust. PPE, when required, is used as specified in the project-specific HASP and as determined by the industrial hygienist present at the job site.

4.3.9 Decontamination

During construction and upon completion of construction, exposed surfaces of equipment used for excavation and soil spreading are decontaminated, if necessary, at designated decontamination areas in each work zone by brushing and wiping until all visible traces of soil and soil-related staining have been removed. If simple brushing and wiping cannot remove all soil/staining, decontamination solutions (e.g., water) are used. All rags, brushes, and spent decontamination solutions are managed per the *Construction Waste Management Plan* (see Appendix H). Following decontamination, the equipment will be surveyed and released by the radiological control technicians.

4.3.10 Site Reclamation

Upon completion of SSSTF construction, reclamation of the work sites is performed, including areas adjacent to any barriers disturbed during construction, laydown areas, and all areas affected by road work and borrow and stockpiling activities. Seeding and mulching are performed in accordance with the requirements identified in the revegetation specification found in Appendix C.

4.3.11 Demobilization

Following completion of SSSTF construction, and decontamination of equipment, the subcontractor will demobilize from the site. The subcontractor will remove the office trailer and ancillary equipment from the site. Temporary fencing and signage, and a decontamination pad, if used, will be removed and disposed of appropriately.

4.4 Field Oversight/Construction Management

The DOE-ID remediation project manager is responsible for notifying the EPA and IDEQ of major project activities (e.g., project start-up or closeout) and other project activities, as deemed appropriate. DOE-ID serves as the single interface point for all routine contact between the EPA and IDEQ and the INEEL Contractor.

The INEEL Contractor is responsible for field oversight and construction management services for this project and provides field support for health and safety, quality assurance, and landlord services. A project organization chart and associated position descriptions are provided in the *HASP for the Construction of the SSSTF* (see Appendix G).

Visitors to the project site who wish to observe the SSSTF construction must meet badging and training requirements necessary to enter INEEL facilities. Project-specific training requirements for visitors are described in the Construction HASP.

4.5 Inspections

The following sections describe the inspections planned for the SSSTF and associated documents. In addition to these inspections, the Agency project managers or their designees may, at their discretion, inspect the site during the construction phase of the SSSTF to assess compliance with the remedial design and the requirements outlined in this Work Plan. These inspections may be conducted at any time during the construction.

4.5.1 Construction Quality Control Inspection

Inspections for construction quality control are conducted per the *Preliminary Inspection Plan for SSSTF Construction Activities* provided in Appendix F. These inspections are accomplished to ensure that all construction activities are in compliance with specifications and drawings. Construction quality control is performed continuously during construction.

4.5.2 Prefinal Inspection

A prefinal inspection is conducted by the Agency project managers at, or prior to, completion of the SSSTF construction and startup activities. The contractor develops a draft Prefinal Inspection Checklist for revision and use by the Agencies in conducting the inspection. The checklist, which focuses on design, construction, and operational elements significant to meeting the ROD requirements, identifies specific activities, procedures, or other items agreed upon by all parties to be inspected that constitute acceptance of the construction activities. The DOE-ID notifies the Agencies approximately 2 weeks prior to the prefinal inspection date.

Following the prefinal inspection, the Prefinal Inspection Checklist is used to develop corrective actions. Although DOE-ID responds to comments received from EPA and IDEQ, the Prefinal Inspection Checklist is not revised. The comments are resolved in the Final Inspection Report, which is included in the Draft Remedial Action Report, a primary document, in accordance with Section 8.4 of the FFA/CO (DOE-ID 1991). The Prefinal Inspection Checklist and subsequent Final Inspection Report include

- Names of the inspection participants
- Completed inspection checklist from each Agency identifying deficiencies and/or outstanding remedial action requirements
- Outstanding construction requirements
- Corrective action required to resolve identified items
- Schedule for completion of corrective actions
- Date of final inspection.

All of the deficiencies and outstanding items, along with the actions required to resolve them, are identified and approved by the Agencies during the prefinal inspection. The Corrective Action Plan then documents any unresolved items and the action(s) required to resolve them.

4.5.3 Final Inspection

The final inspection is conducted following demobilization, when all excess materials and nonessential construction equipment have been removed from the site. Some equipment may remain onsite to repair items observed during the final inspection. The final inspection, conducted by the Agency project managers, confirms the resolution of all outstanding items identified in the prefinal inspection and verifies that the SSSTF construction and startup activities have been completed in accordance with the requirements of the ROD (DOE-ID 1999) and the Corrective Action Plan developed from the prefinal inspections.

4.6 Remedial Action Report

The Remedial Action Report for the SSSTF is prepared following demobilization and final inspection and submitted to the Agencies as a primary document. This report will be discussed in more detail in the ICDF Complex RA Work Plan to be submitted. The schedule for submittal of the RA Report will be presented in the ICDF Complex RA WP.

4.7 Construction Waste Management

Waste resulting from the construction of the SSSTF is managed on-Site as CERCLA waste in accordance with the Final OU 3-13 ROD, the *SSSTF Construction Waste Management Plan* (see Appendix H), and other appropriate regulations, as necessary. All SSSTF construction activities take place within the WAG 3 AOC to allow flexibility in managing the consolidation and remediation of wastes without triggering LDRs, in accordance with the OU 3-13 ROD. The *Construction Waste Management Plan* provides identification of each of the waste streams, describes waste minimization actions, and provides the requirements for waste transportation, waste storage, and ultimate disposal.

4.8 Construction Health and Safety

The *HASP for Construction of the SSSTF* (see Appendix G) was prepared specifically for the tasks and conditions expected during implementation of this project. The HASP, which may be updated as site and project conditions dictate, includes the following elements:

- Task site(s) responsibilities
- Personnel training requirements
- Occupational medical program and medical surveillance
- Safe work practices
- Site control and security
- Hazard evaluation
- PPE
- Decontamination and radiological control
- Emergency response plan for the task site(s).

4.9 Spill Prevention/Response Program

During SSSTF construction, all hazardous materials are stored and handled in a safe manner to prevent spillage. Preventative spill containment is required and implemented per the applicable material safety data sheets and manufacturers' recommendations. Any inadvertent spill or release of potentially hazardous materials (i.e., equipment fluids) is subject to the substantive requirements contained in the "INEEL Emergency Plan/RCRA Contingency Plan" (PLN-114) and the "INEEL Emergency Plan—Addendum 2 Idaho Chemical Processing Plant" (PLN-114-2) as described in the *HASP for Construction of the SSSTF* (Appendix G).

The "INEEL Emergency Plan/RCRA Contingency Plan" may be activated in response to events occurring at the INTEC or at the ICDF Complex or at the discretion of the emergency action manager (EAM). Once the INEEL plan is activated, construction personnel will follow the direction and guidance communicated by the EAM.

4.10 SSSTF Construction Cost Estimate

Cost estimates for construction are enclosed as Appendix M. The construction costs were grouped into six specific work areas and are outlined below:

- Site work - \$124,775
- Utilities - \$1,486,284
- Administration facility - \$257,926
- Truck scale - \$162,748
- Decontamination facility - \$1,742,979
- Treatment equipment - \$1,504,857.

In addition to the areas above, there is a General Overhead account that provides for the Contractor construction support labor, such as QA/QC, work planning, and construction management that amounts to \$579,602, and brings the total to \$5,279,569.

The costs for startup/testing, operations DD&D, and long-term surveillance and maintenance will be presented in the ICDF Complex RA WP.

4.11 SSSTF Construction Schedule

The working schedule and milestone list that details the time frames and goals for the submission of each deliverable are listed in Appendix L. This schedule is a working schedule, which indicates the best effort to perform the SSSTF design, construction, and startup activities for the SSSTF components of the ICDF Complex. Table 4-1 provides a summary of the RD and RA deliverables enforceable milestones for primary documents. These milestones and target dates are within the overall FFA/CO schedule for the INEEL and requests for extensions to the enforceable schedule will be submitted to the Agencies for concurrence and approval.

Table 4-1. Schedule of subsequent SSSTF documents.

Deliverable	Document/Action Type	Enforceable Date	Working Date
SSSTF Soil Stabilization Treatment System Design (modification to SSSTF RD/CWP)	Modification to FFA/CO primary document	--	8/15/02
Draft ICDF Complex RA Work Plan	FFA/CO primary document	12/09/02 ^a	8/19/02

a. The OU 3-13 RD/RA SOW enforceable milestone for the ICDF RD/RA WP is 12/09/02 and for the SSSTF RD/RA WP is 11/28/01. The initial RA WPs were provided in the Draft ICDF RD/RA WP and in the Draft and Draft Final SSSTF RD/RA WP. It was decided to combine these RA WPs into a combined ICDF Complex RA WP. Therefore, this SSSTF RD/CWP is establishing the enforceable milestone for this combined RA WP.

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Appendix A

**Technical and Functional Requirements WAG 3 Staging,
Storage, Sizing, and Treatment Facility**

TFR-17

TO VIEW APPENDIX A SEE:

DOCUMENT ID NUMBER – TFR-17, REV.02

Appendix B

Design Basis

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- B-2. Staging, Storage, Sizing, and Treatment Facility Debris Treatment Process Selection and Design, EDF-ER-1730**
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Appendix B-1

Process and Treatment Overview for the Minimum Treatment Process

EDF-ER-296

TO VIEW APPENDIX B-1 SEE:
DOCUMENT ID NUMBER – EDF-ER-296

Appendix B-2

**Staging, Storage, Sizing, and Treatment Facility Debris
Treatment Process Selection and Design**

EDF-1730

TO VIEW APPENDIX B-2 SEE:
DOCUMENT ID NUMBER – EDF-1730

Appendix B-3

Staging, Storage, Sizing, and Treatment Facility Sanitary Sewer Lift Station

EDF-1937

TO VIEW APPENDIX B-3 SEE:
DOCUMENT ID NUMBER – EDF-1937

Appendix B-4

Staging, Storage, Sizing, and Treatment Facility Flow and Pressure Calculations of the Raw Water and Potable Water Systems

EDF-2655

TO VIEW APPENDIX B-4 SEE:
DOCUMENT ID NUMBER – EDF-2655

Appendix B-5

Staging, Storage, Sizing, and Treatment Facility
INTEC Fire Water System for the ICDF Complex

EDF-1948

TO VIEW APPENDIX B-5 SEE:
DOCUMENT ID NUMBER – EDF-1948

Appendix B-6
Staging, Storage, Sizing, and Treatment Facility
Process Systems Drain Pipe Sizing
EDF-2648

TO VIEW APPENDIX B-6 SEE:
DOCUMENT ID NUMBER – EDF-2648

Appendix B-7

Staging, Storage, Sizing, and Treatment Facility Decon Facility HVAC System

EDF-2676

TO VIEW APPENDIX B-7 SEE:
DOCUMENT ID NUMBER – EDF-2676

Appendix B-8
SSSTF Design Radiological Control Analysis
EDF-ER-302

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Appendix B-9
Staging, Storage, Sizing, and Treatment Facility
Fiber Optic Selection
EDF-2738

TO VIEW APPENDIX B-9 SEE:
DOCUMENT ID NUMBER – EDF-2738

Appendix B-10
Staging, Storage, Sizing, and Treatment Facility
Electrical Load Study
EDF-2747

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Appendix B-11

Staging, Storage, Sizing, and Treatment Facility Access Road and Site Pavement Ballast Requirements

EDF-1913

TO VIEW APPENDIX B-11 SEE:
DOCUMENT ID NUMBER – EDF-1913

Appendix B-12

Staging, Storage, Sizing, and Treatment Facility Post-tensioned Slab Design

EDF-3061

TO VIEW APPENDIX B-12 SEE:
DOCUMENT ID NUMBER – EDF-3061

Appendix C

Design Specifications

TO VIEW APPENDIX C SEE:

**A-E CONSTRUCTION SPECIFICATIONS (SPC) FOR
STAGING, STORAGE, SIZING AND TREATMENT
FACILITY**

DOCUMENT ID NUMBER – SPC-1485

Appendix C-1
Procurement Specification for CPP-1689 Administration
Office Trailer

TO VIEW APPENDIX C-1 SEE:

**PROCUREMENT SPECIFICATION (SPC) FOR STAGING,
STORAGE, SIZING AND TREATMENT FACILITY CPP
1689 ADMINISTRATIVE OFFICE TRAILER (AOT)**

DOCUMENT ID NUMBER – SPC-1484